

# ROADSIDE STORAGE SHELTER RENOVATION

## BURGAW, NC

SCO ID# 07-07006-02A

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### ARCHITECT OF RECORD

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(919) 715-2465

rtaylor@ncdot.gov

### ENGINEERS OF RECORD

#### MECHANICAL ENGINEER

ENGINEERING SOURCE OF NC

(252) 439-0338

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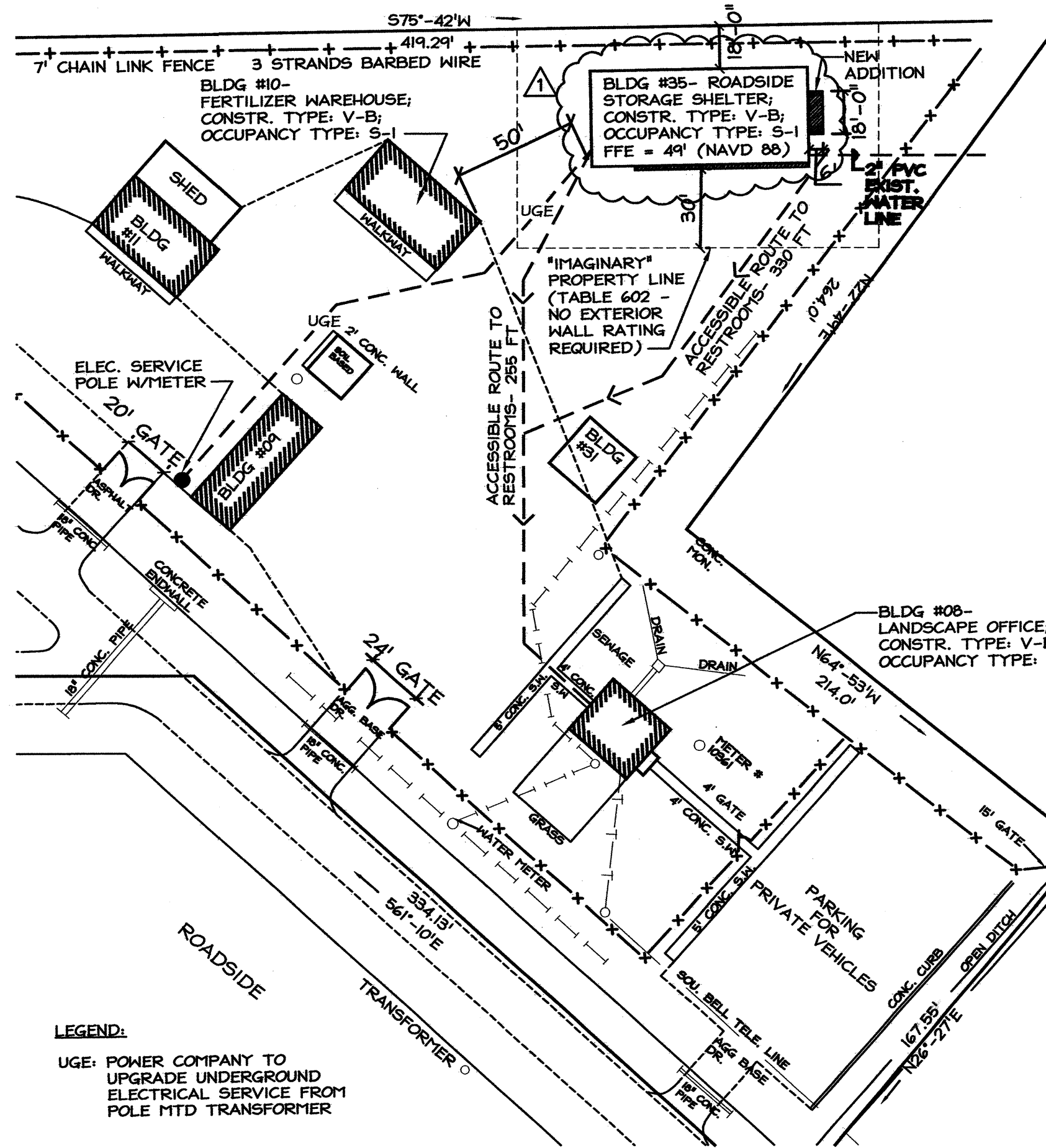
#### ELECTRICAL ENGINEER

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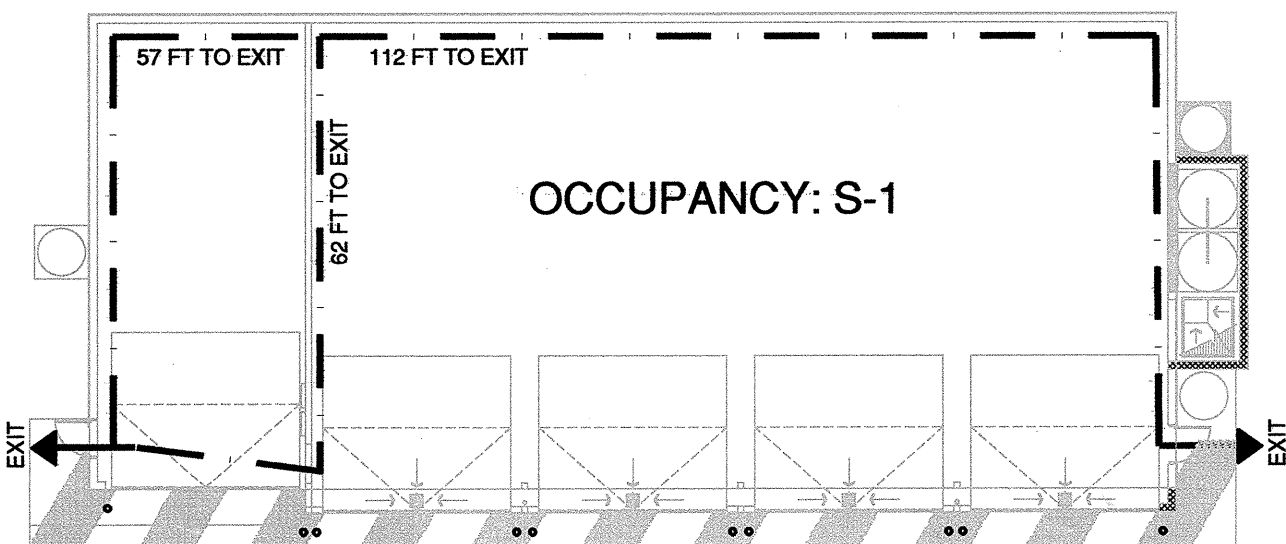
WILSON POU, P.E.

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LEGEND:  
UG: POWER COMPANY TO UPGRADE UNDERGROUND ELECTRICAL SERVICE FROM POLE MTD TRANSFORMER

01 SITE PLAN  
SCALE: 1" = 50'-0"



02 LIFE SAFETY PLAN  
SCALE: 1/16" = 1'-0"

**ENERGY REQUIREMENTS:**  
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If energy cost budget method, state the annual energy cost budget vs allowable annual energy cost budget.

**THERMAL ENVELOPE**  
Method of Compliance:  
☐ Prescriptive ☒ Performance ☐ Energy Cost Budget  
Climate Zone: 6b  
Heating Degree days (base 65 degrees F): 2629  
Cooling Degree days (base 65 degrees F): 1677  
Project Type: New Construction  
Vertical Glazing/Wall Area Pct: 0%  
Building Type: Other

COMPONENT NAME/ DESCRIPTION	GROSS AREA	CAVITY R-VALUE	CONT. R-VALUE	PROPOSED U-FACTOR
ROOF 1: WOOD TRUSS, WITH BATT INSULATION	3900	38.0	0.0	0.028
EXTERIOR WALL 1: WOOD FRAME W/INTEGRAL INSULATION	2904	6.0	-	0.132
EXTERIOR WALL 2: CMU W/INTEGRAL INSULATION	240	5.0	-	0.157
DOOR 1: HOLLOW METAL, INSULATED	42	-	-	0.7
DOOR 2: STEEL SECTIONAL DOOR, INSULATED	960	-	-	0.61
FLOOR 1: SLAB-ON-GRADE, UNHEATED, 2"x24" PERIMETER INSULATION	3840	-	-	-

ENVELOPE PASSES: DESIGN 48% BETTER THAN CODE

### ALLOWABLE AREA

- Primary Occupancy: ☐ Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5  
☐ Business ☐ Educational ☐ Factory ☐ F-1 Moderate ☐ F-2 Low  
☐ Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM  
☐ Institutional ☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4  
☐ I-3 Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5  
☐ Mercantile ☐ Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4  
☐ Storage ☒ S-1 Moderate ☐ S-2 Low ☐ High-piled  
☐ Utility and Miscellaneous ☐ Parking Garage ☐ Open ☐ Enclosed ☐ Repair Garage

- Secondary Occupancy: \_\_\_\_\_
- Special Uses: ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 410 ☐ 411 ☐ 412  
☐ 413 ☐ 414 ☐ 415 ☐ 416 ☐ 417 ☐ 418 ☐ 419 ☐ 420 ☐ 421

Mixed Occupancy: ☒ No ☐ Yes Separation: \_\_\_\_\_ Hr. Exception: \_\_\_\_\_

☐ Incidental Use Separation (508.2)  
This separation is not exempt as a Non-Separated Use (see exceptions).

☐ Non-Separated Use (508.3.2)  
The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.

☐ Separated Use (508.3.3) - See below for area calculations  
For each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

Actual Area of Occupancy A + Actual Area of Occupancy B ≤ 1  
Allowable Area of Occupancy A + Allowable Area of Occupancy B

STORY NO.	DESCRIPTION AND USE	BLDG AREA PER STORY (ACTUAL)	TABLE 503 <sup>a</sup> AREA	(C) AREA FOR OPEN SPACE INCREASE <sup>1</sup>	(D) AREA FOR SPRINKLER INCREASE <sup>2</sup>	(E) ALLOWABLE AREA OR UNLIMITED <sup>3</sup>	(F) MAXIMUM BUILDING AREA <sup>4</sup>
1	TRUCK GARAGE (S-1)	3,840	9,000	NOT USED	NOT USED	9,000	9,000

<sup>1</sup> Frontage area increases from Section 506.2 are computed thus:  
a. Perimeter which fronts a public way or open space having 20 feet minimum width = \_\_\_\_\_ (F)  
b. Total Building Perimeter = \_\_\_\_\_ (P)  
c. Ratio (F/P) = \_\_\_\_\_ (F/P)  
d. W = Minimum width of public way  
e. Percent of frontage increase  $I_r = 100 [F/P - 0.25] \times W/30 = \_\_\_\_\_\%$

<sup>2</sup> The sprinkler increase per Section 506.3 is as follows:  
a. Multi-story building  $I_s = 200$  percent  
b. Single story building  $I_s = 300$  percent

<sup>3</sup> Unlimited area applicable under conditions of Sections Group B, F, M, S, A-4 (507); Group A motion picture (507.9); Malls (402.6); and H-2 aircraft paint hangers (507.8).

<sup>4</sup> Maximum Building Area = total number of stories in the building x E (506.4).

<sup>5</sup> The maximum area of parking garages must comply with 406.3.5. The maximum area of air traffic control towers must comply with 412.1.2.

### ALLOWABLE HEIGHT

	ALLOWABLE (TABLE 503)	INCREASE FOR SPRINKLERS	SHOWN ON PLANS	CODE REFERENCE
Type of Construction	Type V-B		Type V-B	503
Building height in feet	Feet 40'-0"	Feet H+20' = N/A	Feet 20'-0"	503
Building Height in Stories	Stories 1	Stories+1 = N/A	Stories 1	503

### FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	PROVIDED * (W/REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
Structural frame, including columns, girders, trusses							N/A
Bearing walls							
Exterior							
North	>30'	0	N/A				
East	N/A	-					
West	N/A	-					
South	>30'	0					
Interior							
Nonbearing Walls and Partitions							
Exterior Walls							
North	N/A	-					
East	>30'	0					
West	>30'	0					
South	N/A	-					
Interior Walls and partitions							
Floor construction including supporting beams and joist		0	0				
Roof construction including supporting beams and joist		0	0				
Shaft Enclosures-Exit		N/A					
Shaft Enclosures-Other							
Corridor Separation							
Party/Fire Wall Separation		N/A	N/A				
Smoke Barrier Separation		N/A	N/A				
Tenant Separation							
Incidental Use Separation							
Fire Barrier							

\* Indicate section number permitting reduction

APPENDIX B  
BUILDING CODE SUMMARY  
FOR ALL COMMERCIAL PROJECTS  
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)  
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: ROADSIDE STORAGE SHELTER RENOVATION  
Address: BURGAW, NC  
Proposed Use: STORAGE  
Owner or Authorized Agent: GENERAL SERVICES NCDOT Phone # 919-715-0400  
Owned By: STATE OF NORTH CAROLINA ☐ City/County ☒ Private ☒ State  
Code Enforcement Jurisdiction: ☒ City BURGAW ☒ County PENDER

LEAD DESIGN PROFESSIONAL: RANDI K. TAYLOR, R.A.

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural	NC DOT	RANDI K. TAYLOR	3952	(919) 715-2465	rtaylor@ncdot.gov
Civil					
Electrical	ENGINEERING SOURCE OF NC	WILSON POU	22038	(252) 439-0338	wilson@engrsources.com
Fire Alarm					
Plumbing	ENGINEERING SOURCE OF NC	WILSON POU	22038	(252) 439-0338	wilson@engrsources.com
Mechanical	ENGINEERING SOURCE OF NC	WILSON POU	22038	(252) 439-0338	wilson@engrsources.com
Sprinkler-Standpipe					
Structural	NC DOT	W.E. RATTERREE	16394	(919) 715-9341	bratterree@ncdot.gov
Retaining Walls >5' High					
Other					

2009 EDITION OF NC CODE FOR: ☐ New Construction ☒ Addition ☐ Upfit  
EXISTING: ☐ Reconstruction ☐ Repair  
CONSTRUCTED 1956 ORIGINAL USE S1 RENOVATED 1996 (ADDITION) CURRENT USE S1

**BUILDING DATA**

Construction Type: ☐ I-A ☐ II-A ☐ III-A ☐ IV ☐ V-A  
☐ I-B ☐ II-B ☐ III-B ☒ V-B

Mixed construction: ☒ No ☐ Yes Types ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D

Sprinklers: ☒ No ☐ Partial ☐ Yes Class ☐ I ☐ II ☐ III ☐ Wet ☐ Dry

Fire District: ☒ No ☐ Yes Flood Hazard Area: ☒ No ☐ Yes

Building Height: Feet 20' Number of Stories 1

Mezzanine: ☒ No ☐ Yes

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	SUB-TOTAL
1st Floor	3,630	210	3,840
TOTAL	3,630	210	3,840

### STRUCTURAL DESIGN

**DESIGN LOADS:**

Importance Factors: Wind ( $I_w$ ) 1.0  
Snow ( $I_s$ ) 1.0  
Seismic ( $I_p$ ) 1.0

Live Loads: Roof 20 psf  
Mezzanine N/A psf  
Floor 20 KIP AXLE LOAD

Snow Load: 10 psf

Wind Load: Basic Wind Speed 120 mph (ASCE-7-02)  
Exposure Category B  
Wind Base Shears (for MWFRS)  $V_x = 11,000\#$   $V_y = 22,500\#$

**SEISMIC DESIGN CATEGORY** ☐ A ☐ B ☒ C ☐ D

Provide the following Seismic Design Parameters:  
Occupancy Category (Table 1604.5) ☒ I ☐ II ☐ III ☐ IV  
Spectral Response Acceleration  $S_s$  .27 %g  $S_1$  .10 %g  
Site Classification D ☐ Field Test ☒ Presumptive ☐  
Basic structural system: Bearing Wall

Seismic base shear  $V_x = 2,400\#$   $V_y = 2,400\#$  Historical Data  
Analysis Procedure: Simplified  
Architectural, Mechanical, Components anchored? YES  
LATERAL DESIGN CONTROL: Wind  
SOIL BEARING CAPACITIES: 2000 psf presumptive

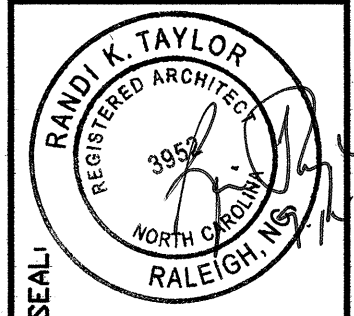
### LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: ☐ NO ☒ YES  
Exit Signs: ☐ NO ☒ YES  
Fire Alarm: ☒ NO ☐ YES  
Smoke Detection Systems: ☒ NO ☐ YES  
Panic Hardware: ☒ NO ☐ YES

### EXIT WIDTH

USE GROUP OR SPACE DESCRIPTION	(A) AREA 1 SQ. FT.	(B) AREA 1 PER OCCUPANT (TABLE 1004.1.1)	(C) CALCULATED EGRESS WIDTH PER OCCUPANT (TABLE 1005.1)	REQUIRED WIDTH (SECTION 1005.1) (a+b)xc	ACTUAL WIDTH SHOWN ON PLANS
STORAGE	3,840	300	13	-	36" DOOR

- 1 See Table 1004.1.1 to determine whether net or gross area is applicable.  
See definition "Area, Gross" and "Area, Net" (Section 1002)  
2 Minimum stairway width (Section 1005.1); min. corridor width (Section 1017.2); min. door width (Section 1008.1)  
3 Minimum width of exit passageway (Section 1021.2)  
4 See Section 1004.5 for converging exits.  
5 The loss of one means of egress shall not reduce the available capacity to less than 50 percent of the total required (Section 1005.1)  
6 Assembly occupancies (Section 1025)



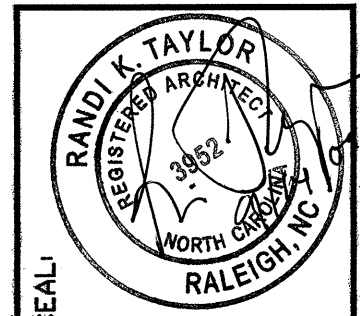
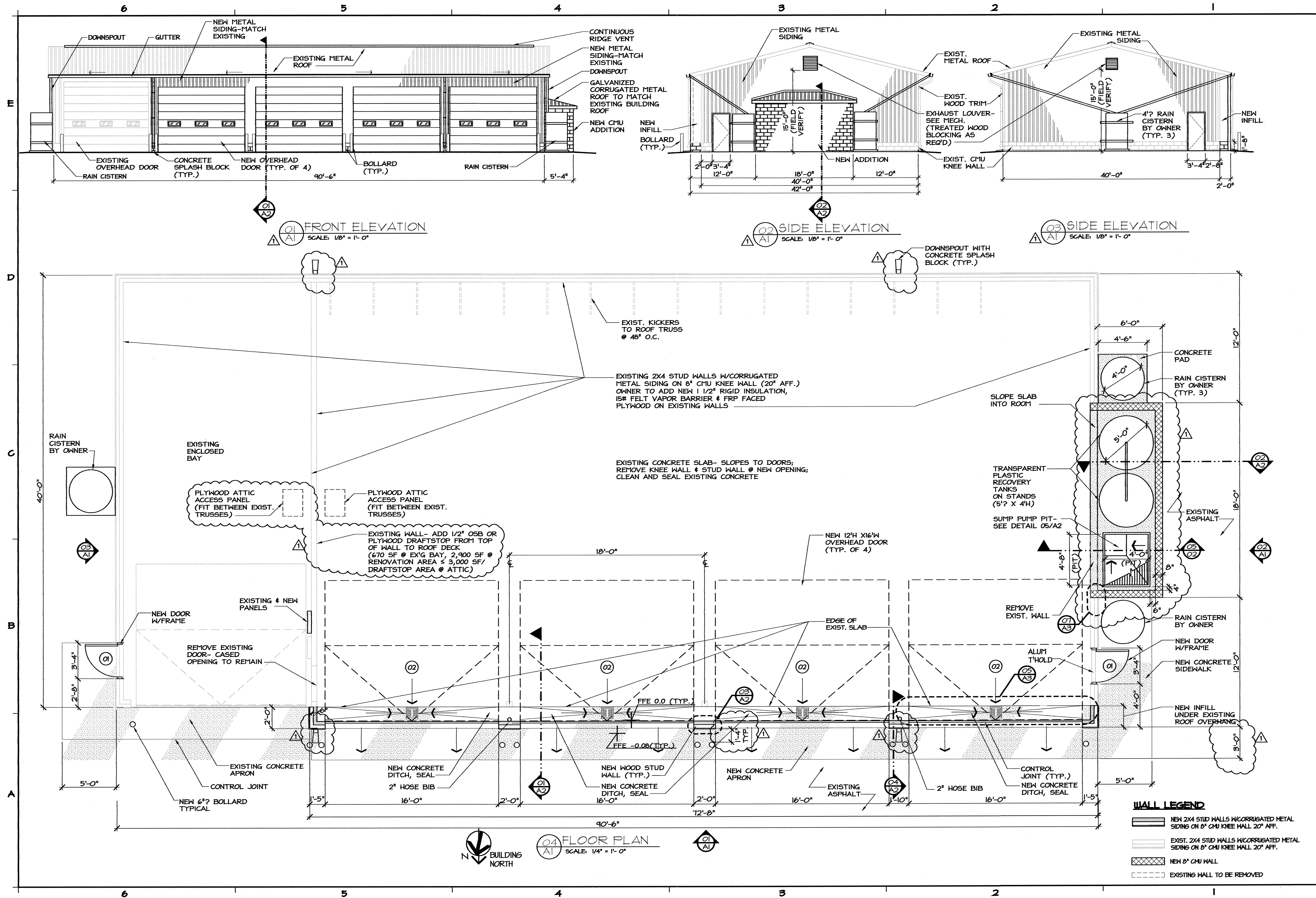
**FACILITIES DESIGN**  
ARCHITECTS & ENGINEERS  
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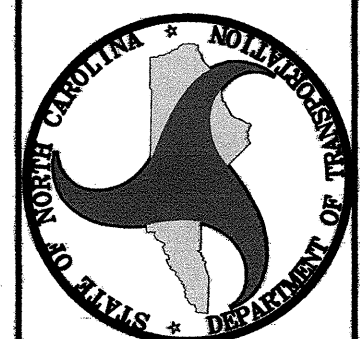
**BURGAW ROADSIDE STORAGE SHELTER RENOVATION**  
PROJECT: **SCO ID # 07-07006-02A**  
REVISIONS  
NO. DATE  
6-10-09  
DATE ISSUED: 10-10-08  
DRAWN BY: AS  
CHECKED BY: RKT  
SHEET NO.

**T1**  
1 OF 1





**FACILITIES DESIGN**  
ARCHITECTS & ENGINEERS  
GENERAL SERVICES DIVISION, NCDOT  
1 SOUTH WILMINGTON STREET  
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RALEIGH, NORTH CAROLINA 27601



**BURGAW ROADSIDE STORAGE SHELTER RENOVATION**  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA

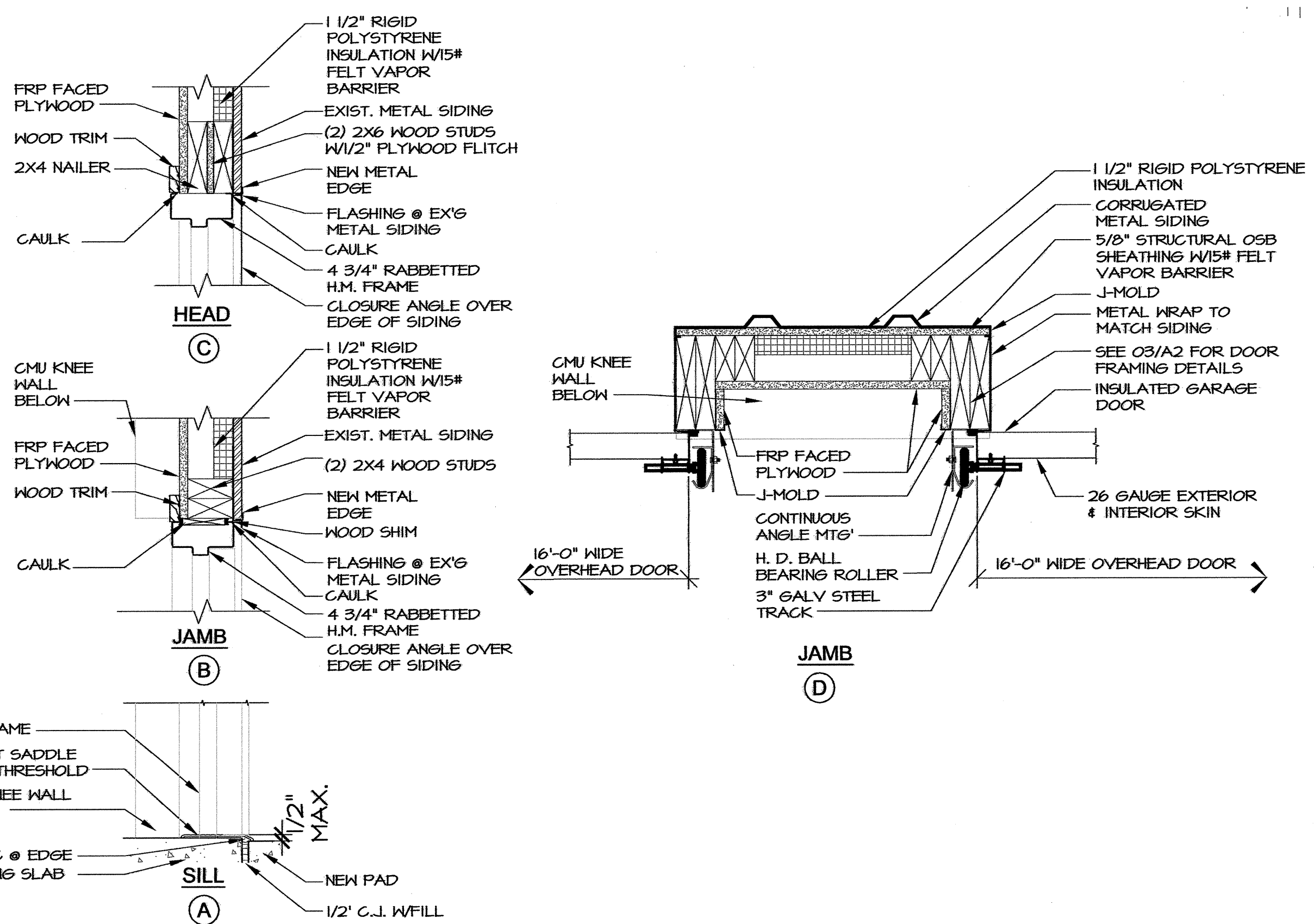
PROJECT: SCO ID #: 07-07008-02A	
REVISIONS	DATE
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DATE ISSUED: 10-10-08	
DRAWN BY: AS	
CHECKED BY: RKT	
SHEET NO.	
<b>A1</b>	
1 OF 5	



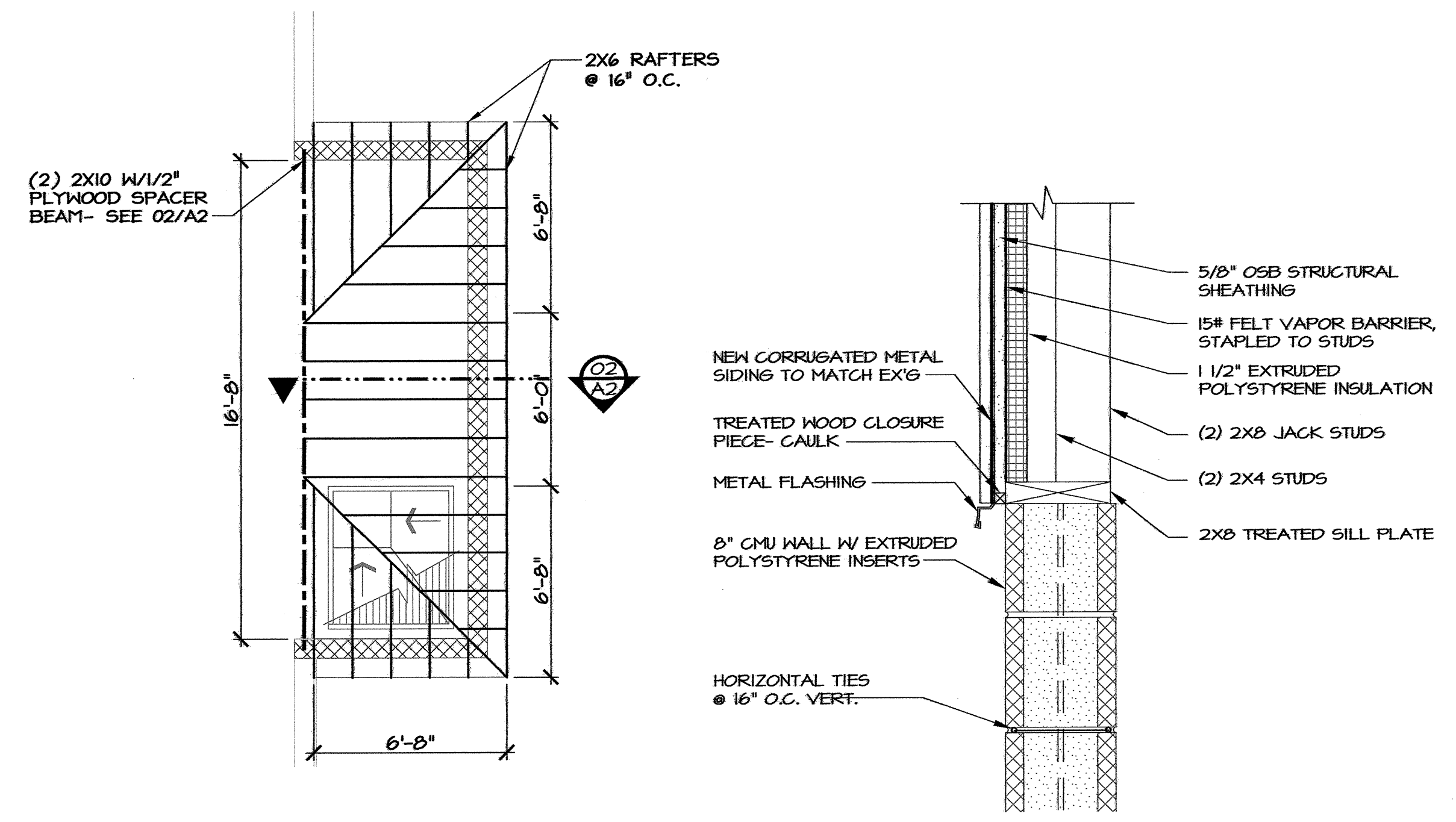
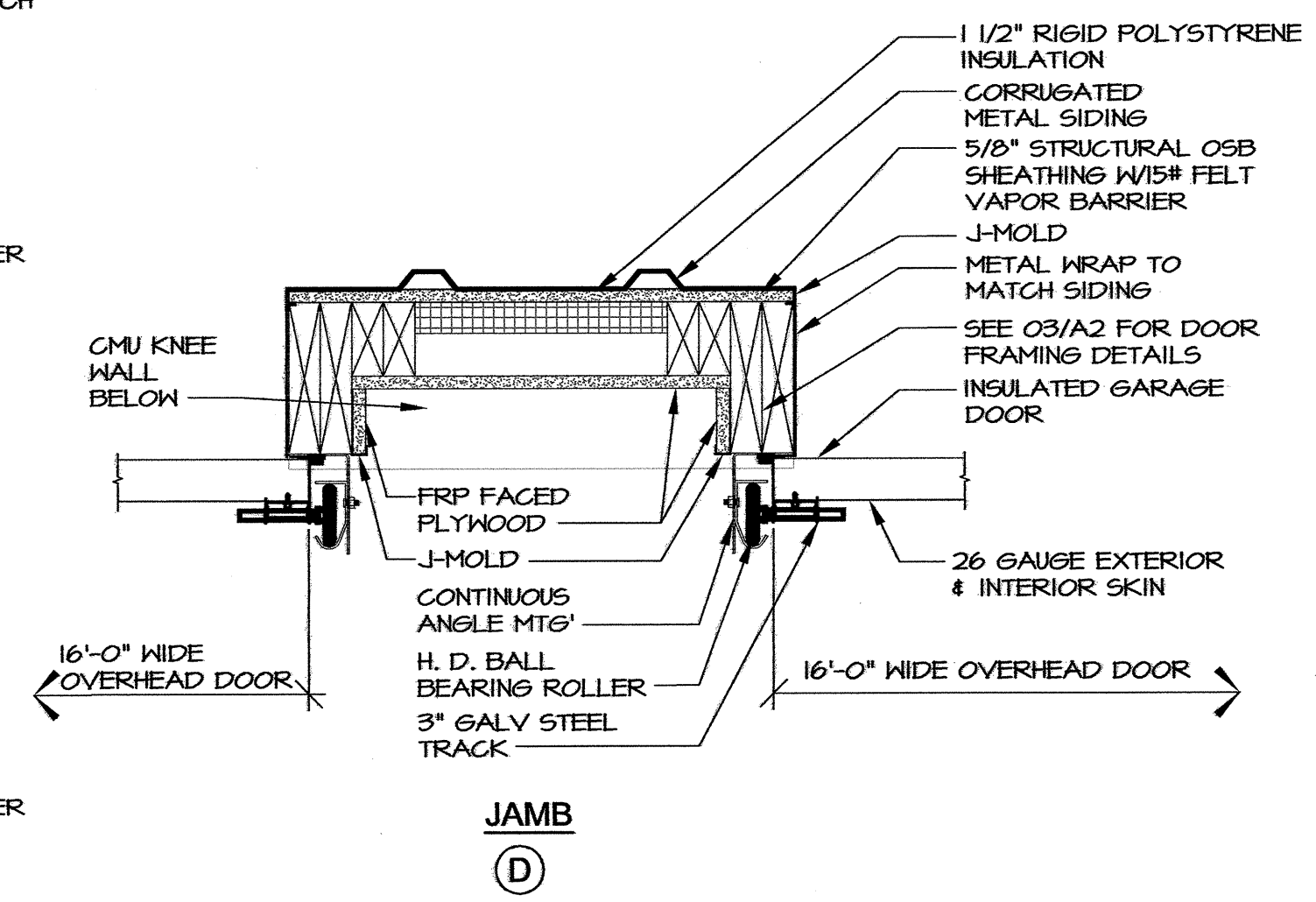




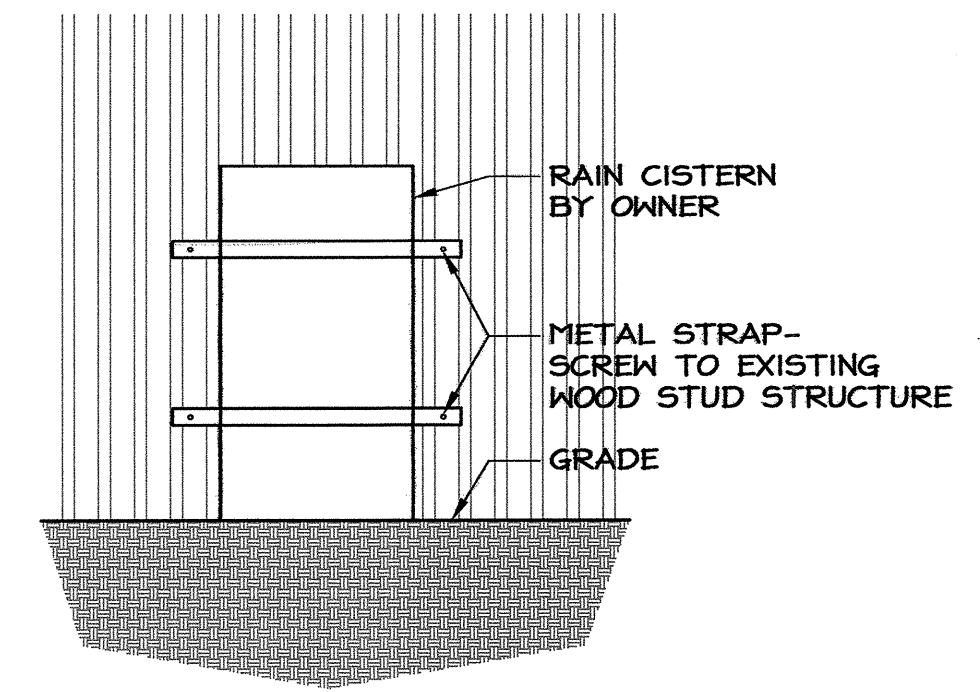
DOOR HARDWARE SCHEDULE												
DOOR			FRAME		HARDWARE					REMARKS		
TYPE	SIZE	MAT.	FINISH	MAT.	FINISH	LOCKSET	HINGES	CLOSER	STOP	KICK PLATE	WEATHER/THRESHOLD	FLUSH FULL
01	3'-0" x 7'-0" x 3/4"	INS. MIL.	PAINT	H.M.	PAINT	ENTRY	A512	-	-	-	316A/316A	260
02	16'-0" x 12'-0"	INS. MIL.	FACTORY	-	-	-	-	-	-	-	-	-



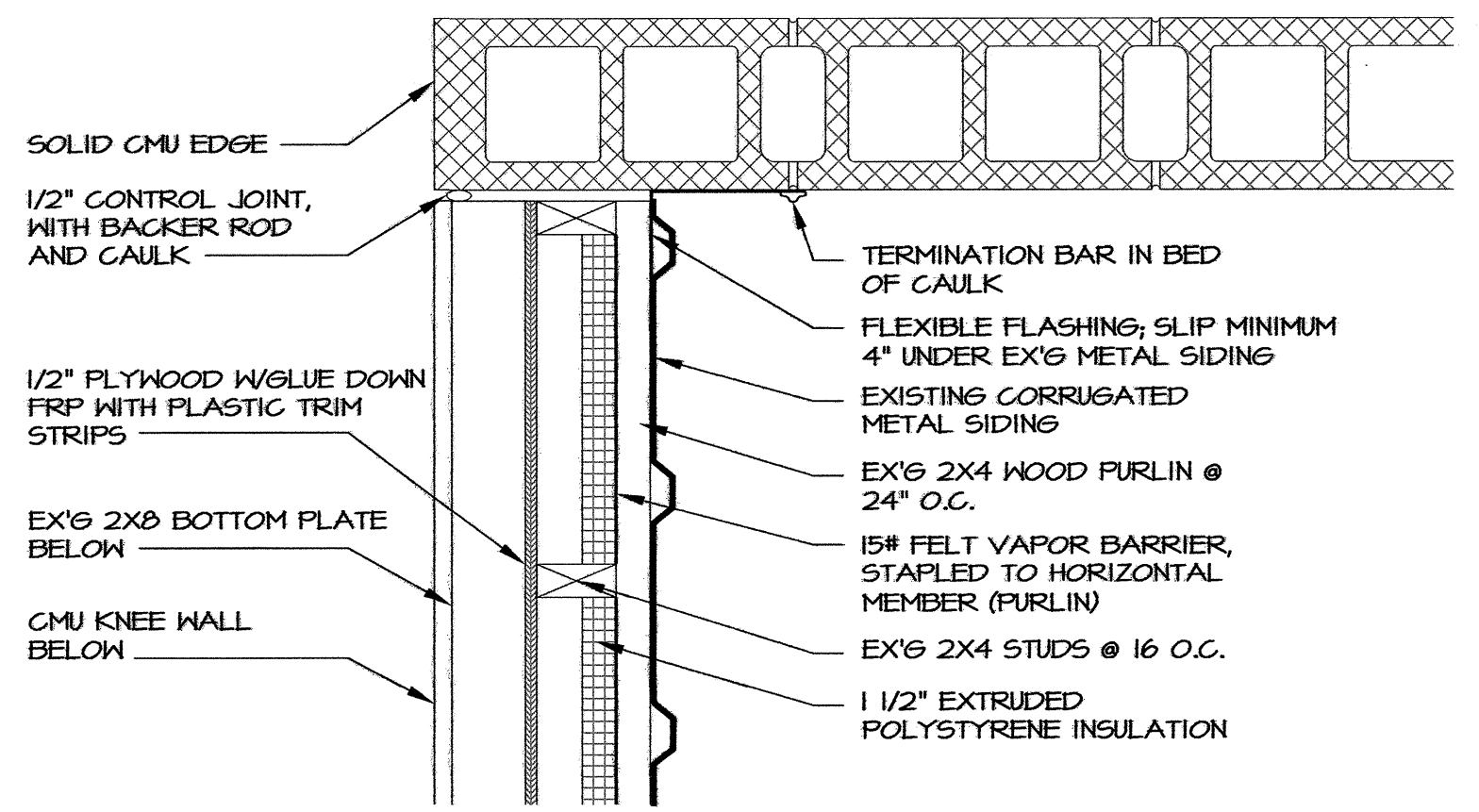
09 DOOR DETAILS  
SCALE: 1/2" = 1'-0"



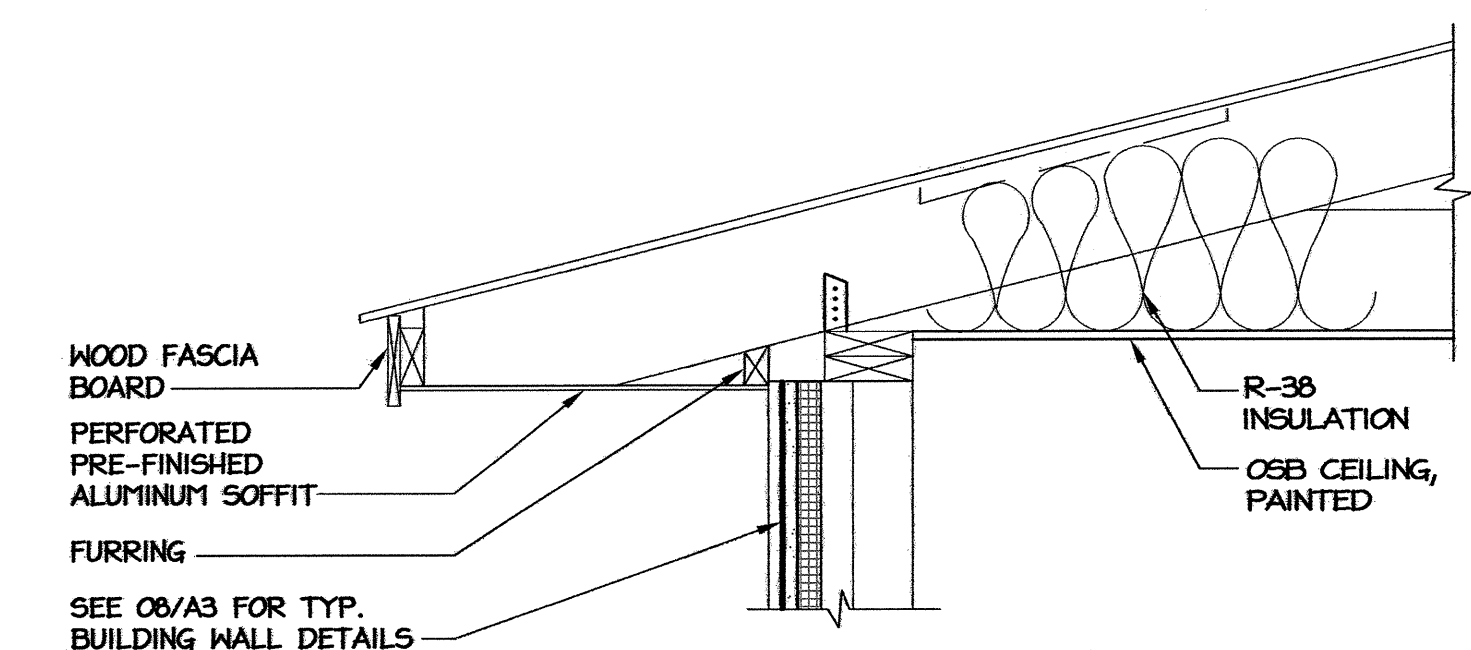
08 PARTIAL WALL SECTION  
SCALE: 1/2" = 1'-0"



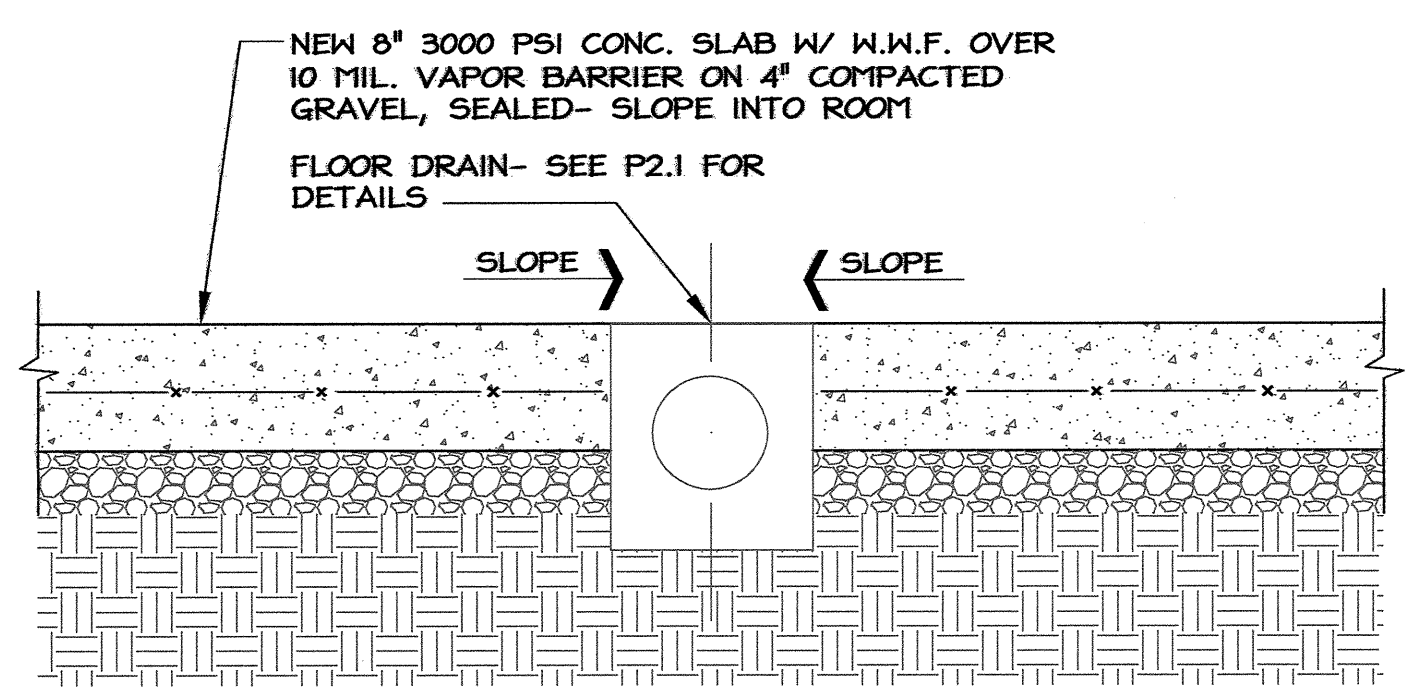
11 RAIN CISTERN SUPPORT DETAIL  
SCALE: 1/4" = 1'-0"



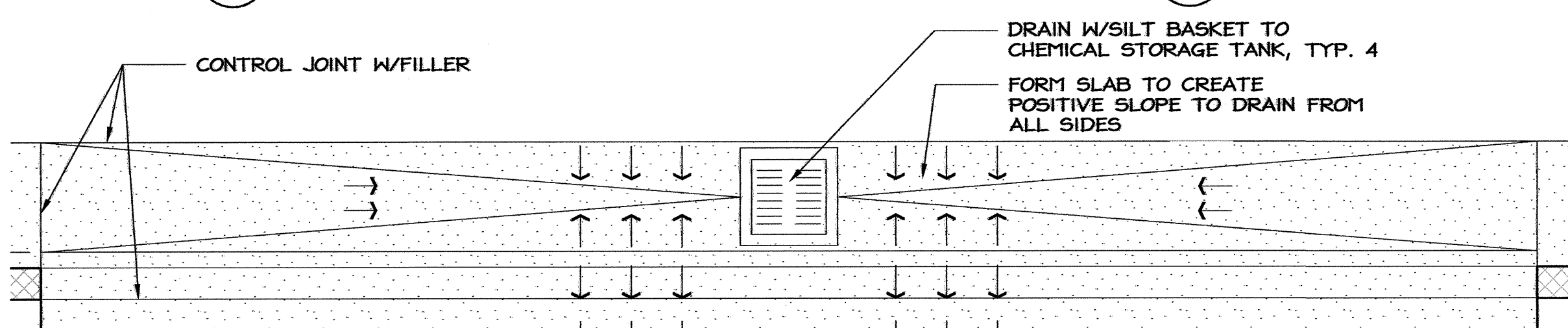
07 NEW CMU WALL TO EXISTING WALL CONNECTION DETAIL  
SCALE: 1/2" = 1'-0"



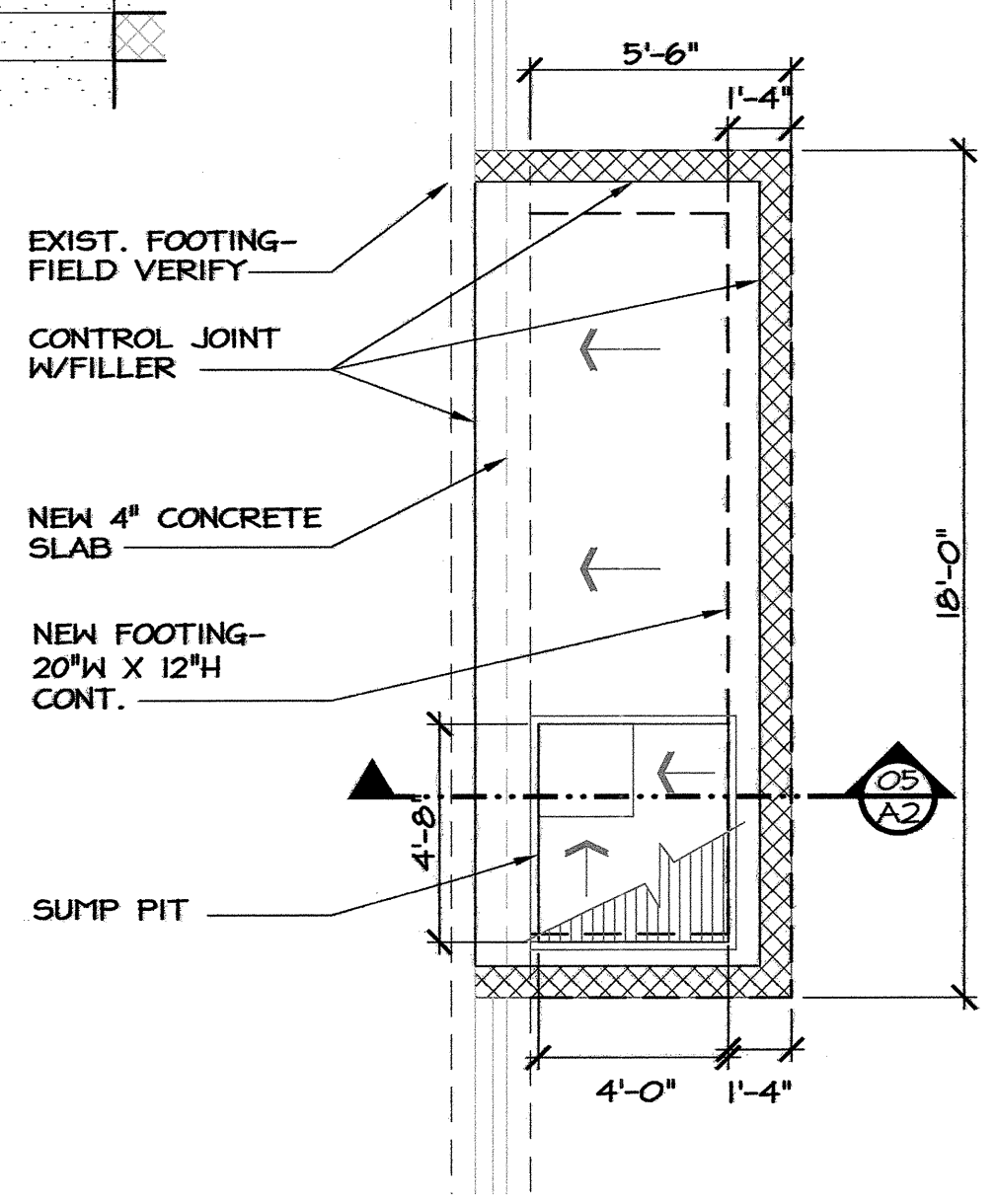
10 EAVE SECTION @ BACK WALL  
SCALE: 1" = 1'-0"



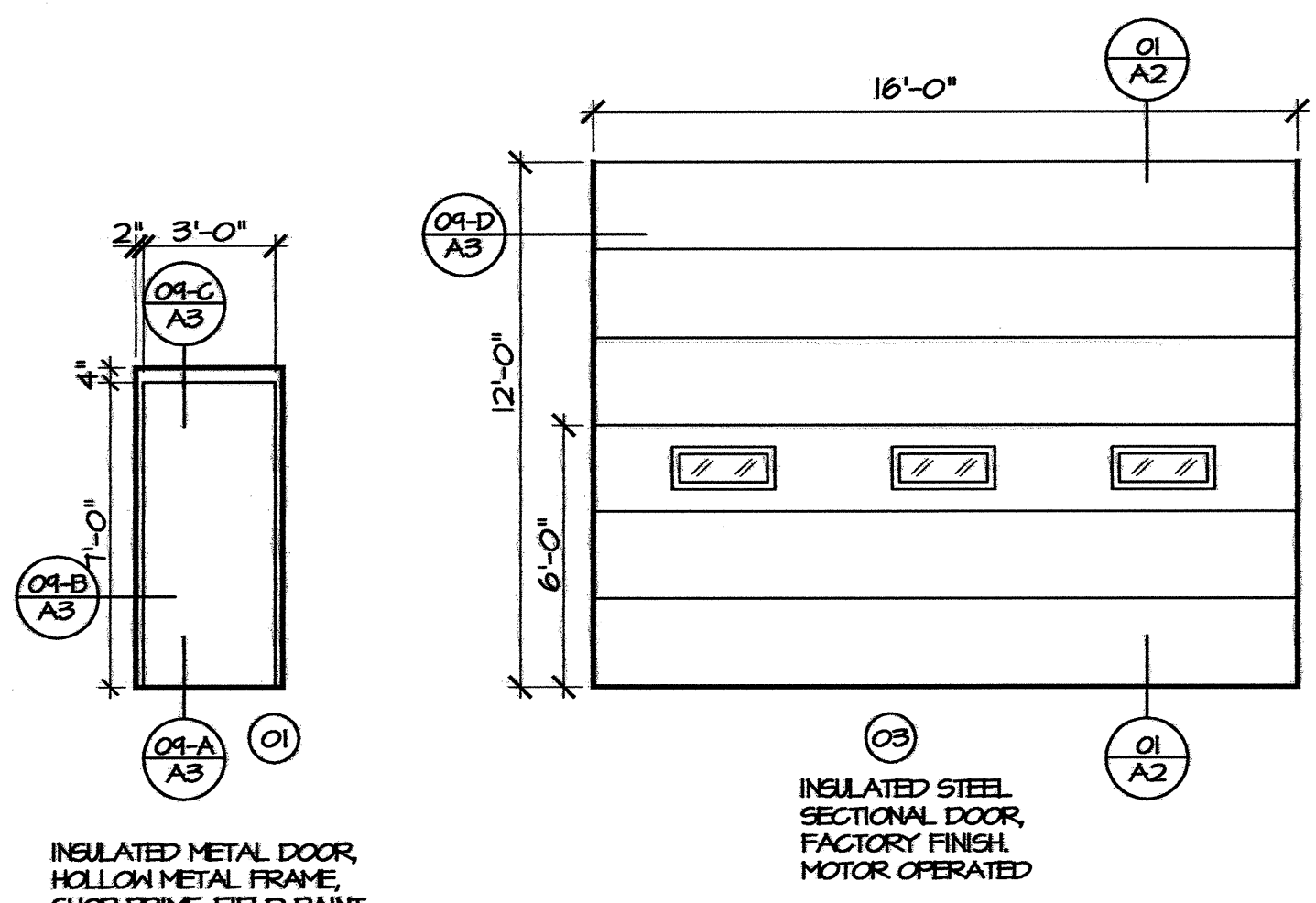
06 SECTION @ FLOOR DRAIN  
SCALE: 1" = 1'-0"



05 DETAIL @ CONCRETE DITCH (TYP. 4)  
SCALE: 3/4" = 1'-0"

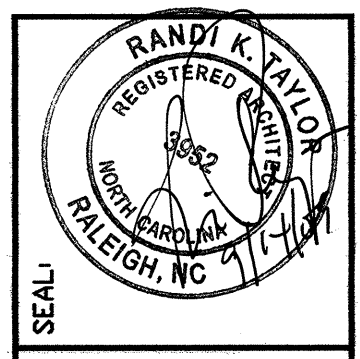


03 NEW ADDITION FOUNDATION PLAN  
SCALE: 1/2" = 1'-0"



01 DOOR & FRAME ELEVATIONS  
SCALE: 1/4" = 1'-0"

04 NEW ADDITION ROOF FRAMING  
SCALE: 1/4" = 1'-0"



**FACILITIES DESIGN**  
**ARCHITECTS & ENGINEERS**  
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**BURGAW ROADSIDE STORAGE**  
**SHELTER RENOVATION**  
 HIGHWAY DIVISION 3, NCDOT  
 PENDER COUNTY, NORTH CAROLINA

PROJECT: SCO ID #: 07-07008-02A	
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SECTION X01

GENERAL REQUIREMENTS

01100 - SUMMARY

A. Summary of Work:

1. The project consists of the construction of a minor addition to existing 3-sided truck shed, as described in the drawings and these specifications.

2. The project location is the NCDOT Division 3 Division Roadside Environmental Unit, Burgaw, NC, work as shown in contract documents prepared by Facilities Design, NCDOT and Engineering Source. All work will be performed by Owner.

B. Project Utility Sources: By Owner

01300 - ADMINISTRATIVE REQUIREMENTS

A. Project Management and Coordination: By Division Engineering Staff.

01400 - QUALITY REQUIREMENTS

A. Quality Control:

1. Field Testing and Inspection: A testing, observation, and inspection required by code; compaction and concrete testing will be done by Owner's forces. Keep a written report of each test or inspection, including details of conditions, methods, and results. Provide certificates required. Electrical inspection will be done by State Electrical Inspector

01600 - PRODUCT REQUIREMENTS: MAINTAIN FOR RECORD AT THE END OF PROJECT

A. Basic Product Requirements:

1. Warranties: Provide all warranties offered by manufacturers and as specified.

01700 - EXECUTION REQUIREMENTS

A. Examination: before starting work, verify substrate capability, and field dimensions.

B. Execution:

1. Install products in manner specified and as required or recommended by manufacturer; if manufacturer's instructions conflict with contract documents, request clarification before proceeding.

C. Starting Equipment and Systems:

1. Before starting, verify that Equipment or system has been properly installed, lubricated, and adjusted, eliminating conditions that might cause damage, proper utility connections have been made correctly, and that electrical characteristics, meter readings, and test results agree with those required by the equipment or system manufacturer. A final inspection by the State Electrical Inspector will be required. Execute start-up in accordance with manufacturer's instructions, under supervision of appropriate Owners and State representatives

01780 - CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Collect and maintain on site.

END OF SECTION X01

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SECTION X03

CONCRETE

03300 - CAST-IN-PLACE CONCRETE

A. Formwork: Any standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

B. Reinforcement:

1. Standard Reinforcing Bars: ASTM A 615/A 615M-2007, Grade 60.

2. Reinforcing Steel Mat: ASTM A 704/A 704M-2006, using ASTM A 615/A 615M-2007 Grade 60 steel bars or rods, unfinished.

3. Fabrication of Reinforcement: Comply with ACI SP-66-2004.

C. Concrete Materials:

1. Cement: ASTM C 150-2005, Type I - Normal.

2. Normal Weight Aggregates: ASTM C 33-2003.

3. Lightweight Aggregates: ASTM C 330-2005.

4. Water: Clean and not detrimental to concrete.

5. Air-Entraining Admixture: ASTM C 260-2006, for 4.0 percent air content.

6. Acceptable Chemical Admixtures: ASTM C 494/C 494M-2005a; Type A - Water Reducing and Type F - Water Reducing, High Range.

D. Concrete:

1. Normal Weight Concrete: Proportions in compliance with ACI 211.1-1991(R02) recommendations.

2. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301-2005.

a. Strength at 28 Days for concrete at 4000 psi

b. Allowable Slump: 4 in.

c. Maximum Water-Cementitious Material Ratio: 0.40.

E. Placing and Finishing Concrete:

1. Place concrete in accordance with ACI 304R-2000.

2. Place and finish concrete for floor slabs in accordance with ACI 302.1R-2004.

3. Do not interrupt successive placement; do not permit cold joints to occur.

4. Hot weather concrete shall meet the requirements of ACI 305, and cold weather concrete shall meet the requirements of ACI 306.

F. Curing: Comply with requirements of ACI 308R-2001. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

1. Prepare floor for epoxy sealant. Do not use liquid curing compound.

2. See 9900 "Paints and Coatings" for concrete sealant

G. Field Quality Control

1. NCDOT's testing agency will perform field quality control tests.

2. Provide free access to concrete operations at project site and cooperate with testing personnel.

3. Notify testing personnel and Designer a min. of 24 hours prior to anticipated pour.

4. Submit proposed mix design of each class of concrete to Designer for review prior to commencement of concrete operations.

5. Compressive Strength Tests: ASTM C 39. For each test, mold and cure five (5) concrete test cylinders. Obtain test samples for every 50 cubic yards or fraction thereof for each day's pour of each concrete class. One slump test shall be performed for each truck at jobsite.

6. Take one additional test cylinder during cold weather concreting, cured on jobsite under same conditions as concrete it represents.

END OF SECTION X03

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SECTION X04

MASONRY

04050 - BASIC MASONRY MATERIALS AND METHODS

A. Masonry Mortar: Use site-mixed mortar.

1. Site-Mixed: ASTM C 270-2005a, with portland cement, proportion specifications.

2. Mortar Mix: Type S with gray cement.

3. Mortar for Reinforced Masonry and Load-Bearing Walls and Partitions: Type M with gray cement.

B. Masonry Grout: Use ready-mixed grout.

1. Ready-Mixed: ASTM C 94/C 94M-2007.

2. Reinforced Masonry: 3,000 psi strength at 28 days; 8-10 inches slump; coarse grout.

3. Bond Beams, Lintels, , and Other Grouted Components: 3,000 psi strength at 28 days; 8-10 inches slump; coarse grout.

4. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

5. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

C. Masonry Joint Reinforcement: Galvanized steel, complying with ASTM A 951/A 951M-2006.

1. Single Wythe: Truss type, 0.156 inch side rods, 3/16 inch cross rods.

D. Reinforcing Steel: ASTM A 615/A 615M-2007 Grade 60 deformed billet steel bars, unfinished.

E. Preformed Control Joints: Molded rubber, neoprene, or polyvinyl chloride with preformed corners and tees.

04200 - MASONRY UNITS

A. Load-Bearing & Non-Load-bearing Concrete Block:

1. Type: ASTM C 90-2006b, hollow, two-cell construction, lightweight.

2. Face Height: 8 inches.

3. Face Length: 16 inches.

4. Exterior Units: Provide manufactured insulation inserts and moisture-resistant admixture.

04800 - MASONRY ASSEMBLIES

A. Perform work in accordance with ACI 530.1-2005.

B. Coursing, Bonding, and Anchoring:

1. Concrete Block: Running bond; one unit and one mortar joint to equal 8 inches, concave joints.

2. Isolate top joint of masonry partitions from horizontal structural members as shown on drawings.

C. Vertical Reinforcement: as shown on drawings

D. Grouting:

1. Place and consolidate grout fill without displacing reinforcing.

2. At bearing locations, fill masonry cores with grout for a minimum 8 inches both sides of opening.

E. Control Joints:

1. Install preformed control joint device in continuous lengths. Seal end, butt, and corner joints.

END OF SECTION X04

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SECTION X05

METALS

05500 - METAL FABRICATIONS

A. Sump Pit cover: Galvanized Welded steel complying with NAAMM MBG 531-2000, "pedestrian" traffic loading.

1. Manufacturers (or fabricated by NC DOT):

a. McNichols Products.

b. Grating Pacific.

c. Robertson Grating Products.

B. Fabrication: Shop assemble items in largest sections practical for delivery.

1. Ease exposed edges to small uniform radius.

2. Make exposed joints butt tight, flush, and hairline.

3. Grind exposed joints flush and smooth with adjacent finish surface.

4. Welding: Comply with AWS D1.1/D1.1M-2006; use welding materials appropriate for materials being welded.

5. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

6. Galvanizing, Where Indicated: ASTM A123/A 123M-2002, minimum 1.25 oz/sq ft.

7. Galvanizing Touch-Up Paint: SSPC-Paint 20-2002(Ed.2004).

END OF SECTION X05

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SECTION X06

WOOD AND PLASTICS

06100 - ROUGH CARPENTRY

A. Lumber Standards:

1. Comply with PS 20-2005 and grading rules of Southern Pine Inspection Bureau (SPIB).

B. Concealed Dimension Lumber:

1. Miscellaneous Blocking, Furring, and Nailers:

a. Species: Any allowed under grading rules.

b. Grade: No. 2 or Standard Grade.

C. Construction Panels:

1. Structural: see Structural drawings for requirements

a. APA Rated Roof Sheathing: Exposure Class Exterior, Structural I; span rating of 24/0 in.

b. APA Rated Wall Sheathing: Exposure Class Exterior, Structural I; span rating of 24/0 in.

2. Non-Structural:

a. Particleboard Underlayment: ANSI A208.1-1993, Grade PBU; 5/8 in thickness.

b. Plywood Backing Panels: PS 1-2007; 1/2 in thickness.

D. Accessories:

1. Fasteners: Hot-dipped galvanized for exterior and high humidity locations, untreated steel elsewhere.

2. Building Paper: No. 15 asphalt felt.

E. Wood Treatment: Comply with AWPA U1-2007.

1. Preservative Pressure Treatment: Use Category appropriate to application, using waterborne preservative.

F. Installation:

1. Construction Panels:

a. Underlayment: Secure to subfloor with nails and glue.

b. Structural Sheathing: Orient perpendicular to framing, with ends staggered over firm bearing, and secure by nails or screws; staples are not permitted.

END OF SECTION X06

SECTION X07

THERMAL AND MOISTURE PROTECTION

07200 - THERMAL PROTECTION

A. Insulation: Thickness and required insulating value as indicated on drawings.

1. Batt Insulation: Glass fiber, with vapor retarder facing, for friction-fit installation.

2. Board Insulation: Rigid polystyrene boards, with vapor retardant facing.

3. Masonry Insulation: polystyrene inserts.

B. Underslab Vapor Retarder: 10 mil polyethylene.

C. Air Barrier: One layer of 15# asphalt-saturated building felt, overlap seams.

07400 - ROOFING AND SIDING PANELS

A. Prefinished Steel Roof Panels: 24 gage, galvanized G90/Z275 per ASTM A 653/A 653M-2006a, corrugated texture, with factory applied siliconized polyester finish; dimensions and configuration as indicated.

1. Color: To match existing.

2. Installation: Fasteners to meet wind load and match existing.

07600 - FLASHING AND SHEET METAL

A. Galvanized Steel Sheet: ASTM A 653/A 653M-2006a, G90/Z275 galvanized.

1. Mediumweight: 26 gage 0.018 inch thick.

B. Sheet Metal Gutters and Downspouts: Prefinished aluminum sheet, mediumweight as specified above.

1. Gutter Style: Rectangular style.

2. Gutter Size: 4" x 5-1/4" inch.

3. Downspout Style: Rectangular.

4. Downspout Size: 4 x 4 inch.

5. Joints: Sealed with silicone sealant.

6. Provide anchors and expansion joints at 30' minimum.

C. Fabrication and Installation: Comply with recommendations of SMACNA (ASMM)-2003 Architectural Sheet Metal Manual.

07700 - ROOF SPECIALTIES AND ACCESSORIES

A. See Mechanical drawings for curb and waterproofing requirements

07900 - JOINT SEALERS

A. Seal the following joints with joint sealer whether so indicated on drawings or not:

1. Expansion and control joints in exterior walls.

2. Joints between door frames and adjacent materials.

3. Control joints in interior ceilings and soffits.

4. Open joints in concrete paving/joints in concrete slab.

5. See Sheet LS-1 for joint sealant requirements at fire rated partitions.

B. Exterior Joint Sealers:

1. For All Locations, Unless Otherwise Indicated: Polyurethane nonsag gunnable elastomeric sealant, complying with ASTM C 920-2005, Class 25, single-component, Uses NT, I (continuous immersion), M, and A.

a. Color: paintable, or standard color matching finished surface.

2. Concrete Paving: Polyurethane, pourable, elastomeric sealant, complying with ASTM C 920-2005, Class 25, single-component, Uses T and M.

C. Interior Sealers:

1. For Joints Exposed to View, Unless Otherwise Indicated: Acrylic emulsion latex, water-based, single part, paintable sealant; white.

2. Joints in Floors: Polyurethane, pourable, elastomeric sealant, complying with ASTM C 920-2005, Class 25, single-component, Use T and M.

END OF SECTION X07

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SECTION X08

DOORS AND WINDOWS

08050 - BASIC DOOR AND WINDOW MATERIALS AND METHODS

08100 - METAL DOORS AND FRAMES

A. Steel Doors:

1. Grade: ANSI A250.8-1998.

a. Exterior Doors: Level 3, Model 1, Full Flush (16 gage), insulated, rated for 120 mph wind zone.

2. Grade: NAAMM HMMA 860-1992, HMMA 861-2000, and HMMA 862-2003 as specified below.

a. Exterior Doors: NAAMM HMMA 862.

3. Finish: Prime painted, unless otherwise indicated.

a. Exterior Doors: Galvanized G60/Z180 per ASTM A 653/A 653M-2006a.

4. Factory prepare and reinforce for hardware specified in accordance with Standard; coordinate with Door Hardware Schedule.

5. Install in accordance with ANSI A250.6-1997 and ANSI A250.11-2001.

6. Manufacturers:

a. Steelcraft.

b. Republic.

c. Ceco.

B. Steel Door Frames: Welded corner type; except fire-rated doors use welded corner type.

1. Grade: NAAMM HMMA 860-1992, HMMA 861-2000, and HMMA 862-2003 as specified below.

a. Exterior Doors: NAAMM HMMA 862.

2. Finish: Prime painted, unless otherwise indicated.

a. Exterior Doors: Galvanized G60/Z180 per ASTM A 653/A 653M-2006a.

3. Factory prepare and reinforce for hardware specified in accordance with Standard; coordinate with Door Hardware Schedule.

4. Manufacturers: Same as for hollow steel doors.

a. Steelcraft.

b. Republic.

c. Ceco.

08300 - SPECIALTY DOORS

A. Sectional Overhead Doors: Galvanized steel panel, insulated, factory finish; torsion spring counterbalanced power operation, similar or equal to Overhead Door 432 Series.

1. Panel Width: Manufacturer's standard inches.

2. Exterior: 24 gauge exterior and 24 gauge galvanized skin, insulation to provide R-7 minimum; weatherstripping on both jambs, sill, and at head; no exposed insulation on either side, 24" x 8" windows, insulated glass.

3. Exterior: Designed to withstand 30 psf positive and 30 psf negative wind pressure without damage. (door performance to meet 120 mph wind zone requirements)

4. Tracks and Guides: Galvanized steel.

5. Galvanizing: ASTM A 653/A 653M-2006a G90/Z275 or equivalent.

6. Finish Color: Submit samples from manufacturer's standard color palette.

7. Power Operator Controls: Push Button.

8. Manufacturers:

a. Overhead Doors.

b. Raynor Garage Doors.

c. Wayne-Dalton Corporation.

9. Hardware: Interior slide lock

9. Automatic Reversing: Each door shall be furnished with automatic safety switch, extending full width of door bottom and located within neoprene or rubber astragal mounted to bottom door rail. Contact with switch before fully closing will immediately stop downward travel and reverse direction to fully opened position.

08700 - HARDWARE

A. General Requirements: See Door and Hardware Schedule in drawing set.

1. Material and Finish: Satin chromium plated 626 - old notation "US 26D", complying with ANSI/BHMA A156.18-2006.

B. Keys:

1. Key to Owner's existing keying system.

C. Hinges: Hang each door with suitable hinges or pivots, for free and easy operation.

1. Full mortise butt hinges unless otherwise indicated.

2. Exterior door hinges shall have non-removable pin.

D. Butt Hinges: Five-knuckle, complying with ANSI/BHMA A156.1-2006. ANSI numbering system is used only to indicate configuration; comply with all requirements of standard and of specification.

1. Dimensions: Complying with ANSI/BHMA A156.7-2003, sizes as recommended by manufacturer for application.

a. 1-3/4 inch thick doors: Minimum 4-1/2 inch by 4-1/2 inch.

2. Material: Steel, plated with specified finish.

a. Exception for doors with hinge barrel exposed to outdoors: Brass or bronze with specified finish (plated if necessary) or stainless steel.

3. Manufacturers:

a. Soss.

b. Hager Companies.

c. Stanley.

E. Locksets: Mortise type, (exterior doors)

1. Grade: Complying with ANSI/BHMA A156.13-2005.

a. Exterior Doors: Grade 1.

2. Trim: Lever handle

3. Function: Entry

4. Manufacturers:

a. Corbin Russwin.

b. Schlage.

c. Yale.

d. Sargent

F. Weatherstripping for Swinging Doors: Compression-type, unless otherwise indicated; neoprene.

1. Retainers: Aluminum of finish matching door finish.

2. Fasteners: Tamperproof.

3. Provide as noted in schedule.

a. At Jamb and Head: Bulb type adjustable after installation.

b. On Steel Frames: Magnetic type.

4. Install so air leakage is minimized, while allowing free operation and low-pressure closing of door.

G. Thresholds: Occur at two personnel doors.

1. Height Above Finish Floor: 1/2 inch high, beveled, with no slope greater than 1:2.

2. Provide at each exterior door. Set in bed of sealant.

3. Manufacturers: Similar or equal to National Guard Products Extra Heavy Duty threshold 425HD, 5"wide x 12" high, non slip surface, fully bed in caulk. Contractor to field verify all door openings.

H. Hardware Specified Elsewhere:

1. Overhead Doors: See 08300.

END OF SECTION X08

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PROJECT: **BURGAW ROADSIDE STORAGE**  
**SHELTER RENOVATION**  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA

SCO ID #: **07-07008-02A**

REVISIONS	
NO.	DATE
1	6-10-09

DATE ISSUED: 10-10-08

DRAWN BY: AS

CHECKED BY: RKT

SHEET NO.

**A4**

4 of 5



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SECTION X09  
FINISHES

09700 - WALL FINISHES

A. Fiberglass Reinforced Panels:

1. Prefinished FRP (Fiberglass Reinforced Plastic) wall panels, manufactured by Marlite or equal.
2. All trim specified shall be extruded aluminum or extruded rigid PVC.
3. Flame spread: Class III or C.

09900 - PAINTS AND COATINGS

A. Materials:

1. One Manufacturer per System: Provide fillers, undercoats, primer, and finish coats for any one surface by same manufacturer. Do not combine products by different manufacturers on same substrate.
2. Quality Level: Provide manufacturer's best quality paint of each of the types specified, in containers that are fully labeled with manufacturer's complete product identification.
3. Manufacturers:

B. Interior Floor Coating and/or Sealant Systems:

1. Garage & sump pit
  - a. First treatment: use a fluid contaminant extractant and deep penetrating sealant, no VOC, to prepare concrete surface for top coat
  - b. Top coat: Solvent based epoxy floor sealer

C. Exterior & Interior Opaque Coating Systems:

1. Concrete Masonry:
  - a. Semigloss Acrylic Finish:
    - 1) Filler: One coat high performance latex block filler.
    - 2) Finish: Two coats semigloss acrylic latex exterior enamel.
2. Wood soffit/trim:
  - a. Semigloss Acrylic Finish:
    - 1) Primer: One coat acrylic latex exterior wood primer.
    - 2) Finish: Two coats semigloss acrylic latex exterior enamel.
3. Ferrous Metal:
  - a. High Gloss Acrylic Finish:
    - 1) Primer: One coat rust-inhibitive alkyd or epoxy metal primer.
    - 2) Finish: Two coats high gloss acrylic latex exterior enamel.
4. Zinc-Coated Metal:
  - a. Semigloss Acrylic Finish:
    - 1) Primer: One coat galvanized metal primer.
    - 2) Finish: Two coats semigloss acrylic latex exterior enamel.

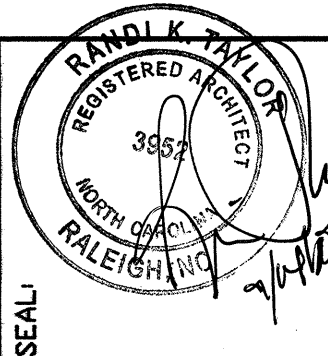
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SECTION X10

SPECIALTIES

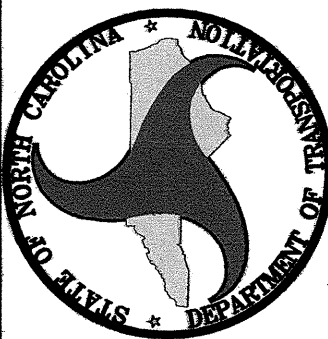
10200 - LOUVERS AND VENTS: FOR EXHAUST LOUVERS, SEE MECHANICAL DRAWINGS

END OF SECTION X10



SEAL

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SCO ID #: 07-07008-02A

REVISIONS	
NO.	DATE
1	6-10-09

DATE ISSUED: 10-10-08

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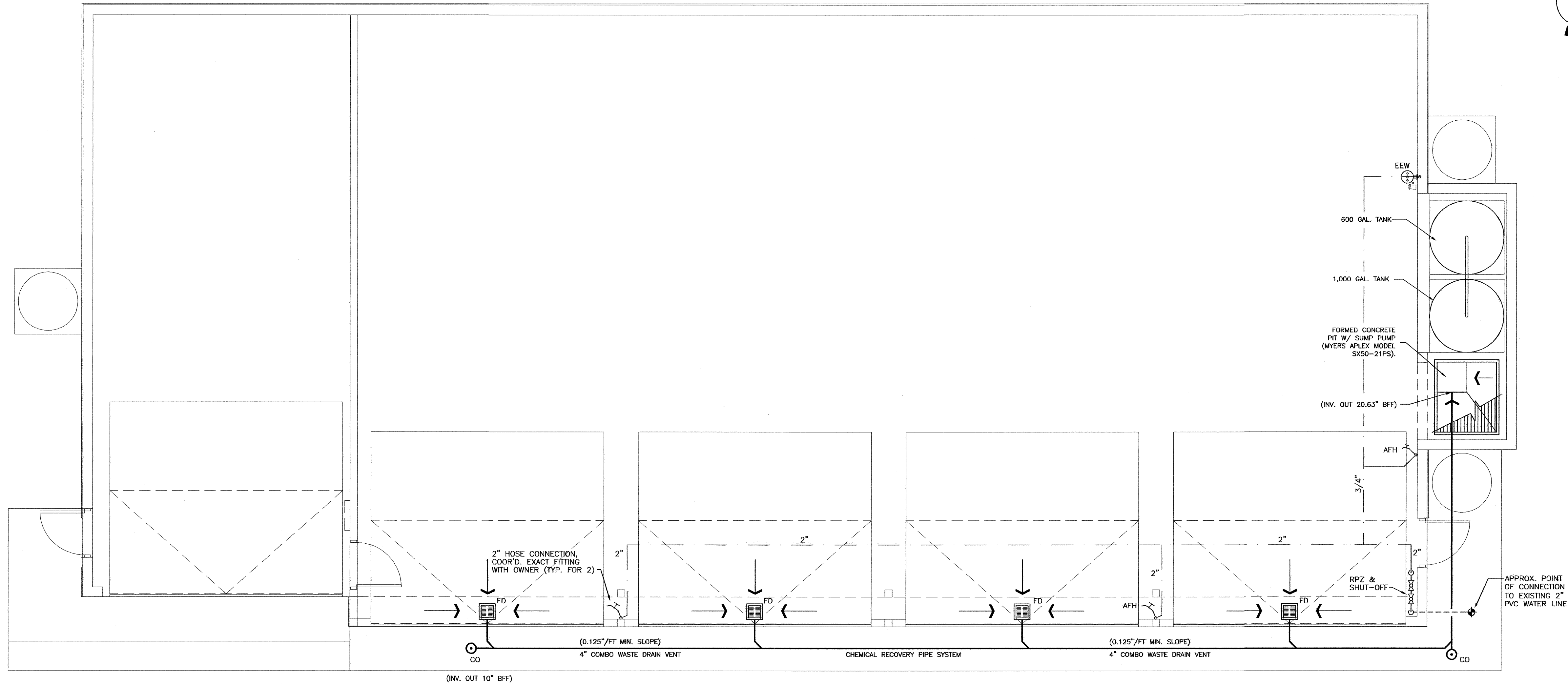
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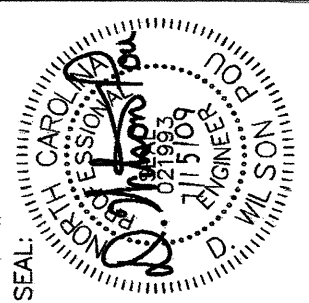





**PLUMBING PLAN**  
SCALE: 1/4"=1'-0"


FIXTURE CALCULATIONS JUSTIFICATION			
OCCUPANCY = STORAGE BATHROOMS ARE NOT REQUIRED PER NOTE N. ON TABLE 403.1 IN THE 2006 PLUMBING CODE	MINIMUM PLUMBING FIXTURES		
	FROM TABLE 403.1		
		TOTAL REQUIRED	TOTAL PROVIDED
	MALES	NONE	NONE
	FEMALES	NONE	NONE
	DRINKING FOUNTAINS	N/A	N/A

FIXTURE UNIT REQUIREMENTS	
POTABLE WATER SUPPLY	6.5 GPM USE 3/4" SERVICE
WASTE	NO SEWER SERVICE


SEAL: 

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**BURGAW ROADSIDE STORAGE**  
**SHELTER RENOVATION**  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA

PROJECT: BURGAW ROADSIDE STORAGE  
SCO PROJECT NO. 07-07006-02A  
ES JOB NO. ES08033

REVISIONS  
 06-10-09  
SCO COMMENTS AND DESIGN CHANGES

DATE ISSUED: 05-02-08  
DRAWN BY: CLB  
CHECKED BY: DWP

SHEET NO.  
**P1.1**  
OF

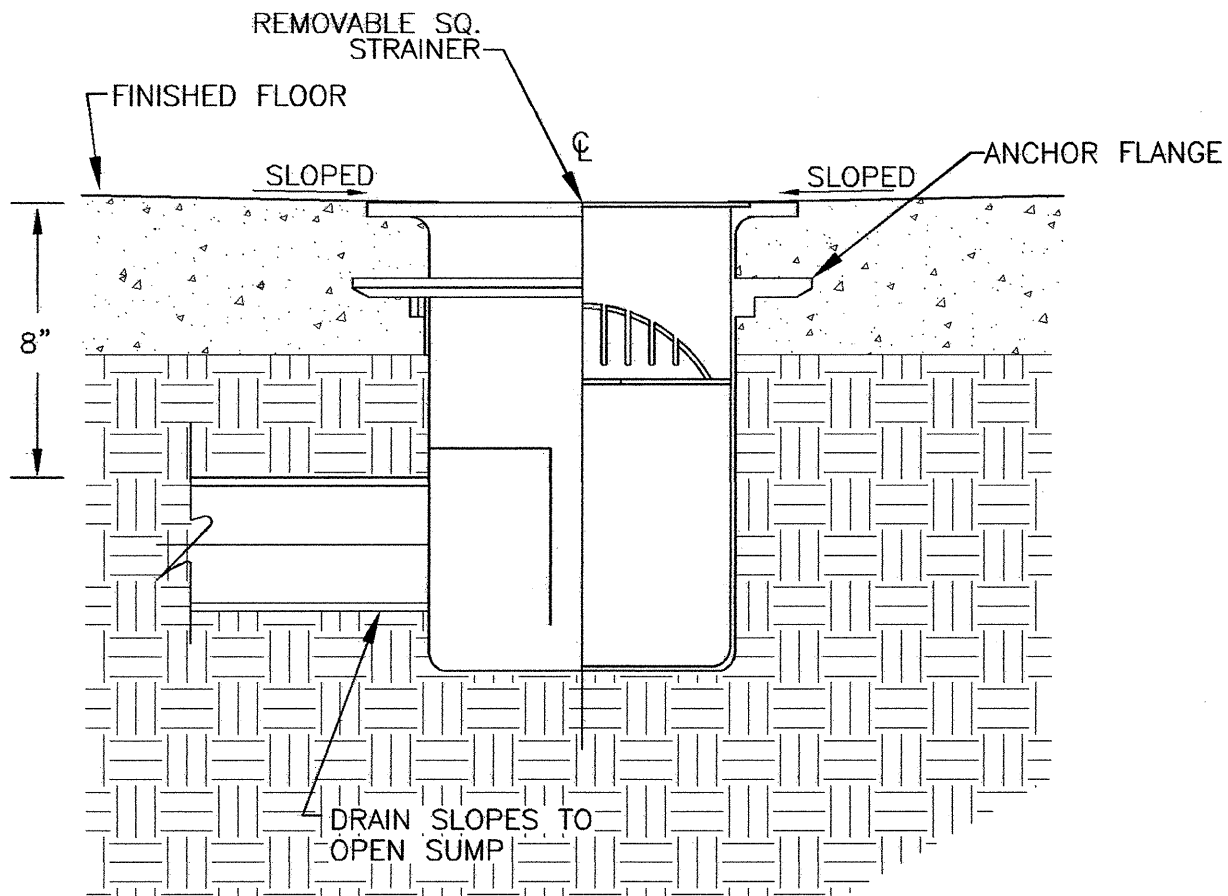


PLUMBING GENERAL NOTES:

1. THE ENTIRE PLUMBING SYSTEM SHALL BE IN ACCORDANCE WITH N.C. PLUMBING CODE AND LOCAL PLUMBING INSPECTOR.
2. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES PRIOR TO INSTALLATION. CONTRACTOR SHALL COORDINATE ROUTING OF ALL PIPING WITH EXISTING CONDITIONS AND SHALL PROVIDE ANY NECESSARY OFFSETS, TEES, REROUTING, ETC. REQUIRED FOR A COMPLETE AND COORDINATED INSTALLATION.
3. THESE PLANS ARE DIAGRAMMATIC. CONTRACTOR SHALL PROVIDE ALL NECESSARY OFFSETS, TEES, ELBOWS, ETC. FOR A COMPLETE WORKING PLUMBING SYSTEM.
4. ALL BELOW GRADE PIPE OUTSIDE OF THE BUILDING SHALL BE BURIED WITH A MAGNETIC TYPE LOCATOR STRIP. STRIP SHALL HAVE AT LEAST 6 INCHES OF COVER.
5. CONTRACTOR SHALL COORDINATE ANY PLUMBING SYSTEM REQUIRING SHUTDOWN WITH THE OWNER 48 HOURS IN ADVANCE.
6. ALL DOMESTIC WATER PIPING SHOWN IS ABOVE BETWEEN FLOOR JOIST/WITHIN WALLS, AND IN CRAWL SPACES UNLESS OTHERWISE NOTED.
7. ALL DOMESTIC WATER PIPING 1" ABOVE SLAB SHALL BE TYPE "L" HARD DRAWN COPPER WITH LEAD FREE SOLDER. ALL WATER PIPING BELOW SLAB SHALL BE TYPE "K" SOFT COPPER WITH NO JOINTS (MINIMUM 15'-0" LENGTH BELOW GRADE). EXTERIOR PIPE BELOW GRADE, AFTER 15'-0" OF COPPER TUBING, SHALL BE PVC PIPE LISTED FOR DOMESTIC WATER SERVICE USE.
8. ALL COPPER WATER PIPING IN FLOOR SLEEVE OR ABOVE GRADE SHALL BE INSULATED WITH CLOSED CELL FLEXIBLE ELASTIMERIC TYPE INSULATION WITH THE FLAME DENSITY RATING NOT EXCEEDING 25 & THE SMOKE DENSITY RATING NOT EXCEEDING 50. THICKNESS FOR COLD WATER PIPING SHALL BE 1/2" THICK. THICKNESS FOR HOT WATER & RETURN PIPING SHALL BE 1" THICK. INSTALL SADLES AS REQUIRED IN ALL LOCATIONS TO PREVENT COMPRESSION OF INSULATION.
9. ALL BRANCH LINES SHALL HAVE SHUT-OFF VALVES. ALL DOMESTIC WATER BALL VALVES SHALL BE BRASS BODY, FULL PORT, CHROME PLATED BALL. TEFLON SEATS 150 # WSP, FOR SIZES 1/2" THRU 2". PROVIDE VALVE HANDLE EXTENSIONS AS REQUIRED FOR INSULATION.
10. ALL PIPING SHOWN IS BELOW SLAB/WITHIN WALLS UNLESS NOTED OTHERWISE. ALL SANITARY VENT PIPING SHOWN IS ABOVE CEILING/WITHIN WALLS UNLESS NOTED OTHERWISE.
11. CHEMICAL RECOVERY PIPE SHALL BE BY OWNER (SEE TANK DETAIL). ALL JOINTS SHALL BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS TO MAINTAIN SYSTEM LISTING/RATING.
12. ALL PIPING SYSTEMS SHALL BE SUPPORTED AS REQUIRED BY NC PLUMBING CODE AND MANUFACTURERS RECOMMENDATIONS.
13. ALL PIPING PENETRATIONS THRU NEW AND EXISTING WALLS SHALL BE SEALED TO EQUAL RATING OF THE NEW/EXISTING WALL.
14. ALL PLUMBING SYSTEMS SHALL BE TESTED AS REQUIRED PER N.C. PLUMBING CODE. PROVIDE OWNER CERTIFIED TEST RESULTS IN THE PROJECT CLOSE-OUT DOCUMENTS PER SCO REQUIREMENTS.
15. THE PLUMBING CONTRACTOR SHALL COORDINATE ALL UNDER SLAB PIPING WITH ALL STRUCTURAL FOUNDATIONS, P.C. SHALL COORDINATE ALL UNDER SLAB PLUMBING WITH ELEVATION INVERTS WITH THE SITE UTILITY INVERTS.
16. ALL EXPOSED WATER SUPPLY AND WASTE LINES UNDER OPEN FIXTURES, SINKS, AND LAVATORIES SHALL HAVE PROTECTIVE DEVICES INSTALLED TO MEET LATEST NCSCB AND ADA REQUIREMENTS.
17. THE ENTIRE PLUMBING SYSTEM SHALL BE DISINFECTED IN ACCORDANCE WITH NC PLUMBING CODE.
18. ROOF DECKING SHALL NOT BE PENETRATED TO SUPPORT WASTE LINES, VENT LINES, AND WATER SUPPLY LINES.
19. ALL ACCESS COVERS INCLUDING BUT NOT LIMITED TO IN-GRADE CLEANOUTS, MANHOLES, AND WATER METER BOXES SHALL BE FLUSH WITH FINISHED GRADE UNLESS OTHERWISE SPECIFIED

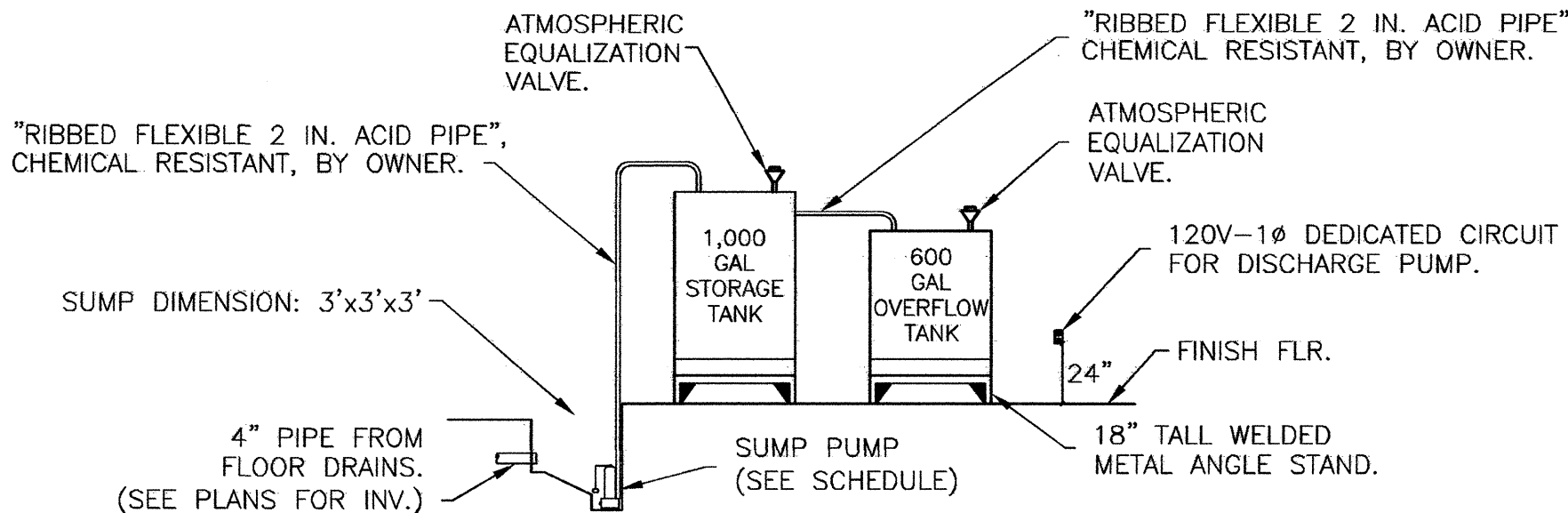
PLUMBING FIXTURE SCHEDULE							
ITEM	DESCRIPTION	FINISH	COLD	HOT	VENT	WASTE	ADA
AFH	WALL HYDRANT - WOODFORD SANITARY AUTOMATIC DRAINING FREEZELESS HYDRANT, WITH VAC BREAKER M# B65 (OR EQUAL PRODUCT FROM MANUFACTURERS LISTED BELOW)	CHROME	3/4"				
EEW	EMERGENCY EYE WASH - WALL MOUNTED EYEWASH BRADLEY MODEL# S19-220PT (OR EQUAL PRODUCT FROM MANUFACTURERS LISTED BELOW)	CHROME	1/2"				
CO	CLEAN-OUT IN FLOOR - ZURN MODEL # ZN-1444-BP WITH INSIDE CAULK CONNECTION (OR EQUAL PRODUCT FROM MANUFACTURERS LISTED BELOW)	BRONZE				3"	
FD	FLOOR DRAIN - ZURN M# Z645 HEAVY-DUTY DRAIN (OR EQUAL PRODUCT FROM MANUFACTURERS LISTED BELOW)	NICK-BRNZ				3"	
RPZ	REDUSED PRESSURE ZONE BACKFLOW PREVENTER- WATTS MODEL# 009M2QT-S INSTALL PER MANUFACTURERS SPECIFICATIONS. (OR EQUAL PRODUCT FROM MANUFACTURERS LISTED BELOW)		2"			3"	
SP	SUMP PUMP- MYERS APLEX MODEL: SX50-21PS TEMPERATURE TO 140°. EXPLOSION-PROOF SUMP PUMP CONTROL PANEL 1/2 HP 95 GPM (OR EQUAL PRODUCT FROM MANUFACTURERS LISTED BELOW)	CAST FINISH.				1-1/2"	

\*MODEL NUMBERS ARE PROVIDED TO ESTABLISH A LEVEL OF QUALITY. EQUAL QUALITY PRODUCTS BY CHICAGO FAUCET, DELTA, MOEN, BRADLEY, JOSAM, AND CONBRACO ARE ACCEPTABLE.



GARAGE FLOOR DRAIN

SCALE: NTS

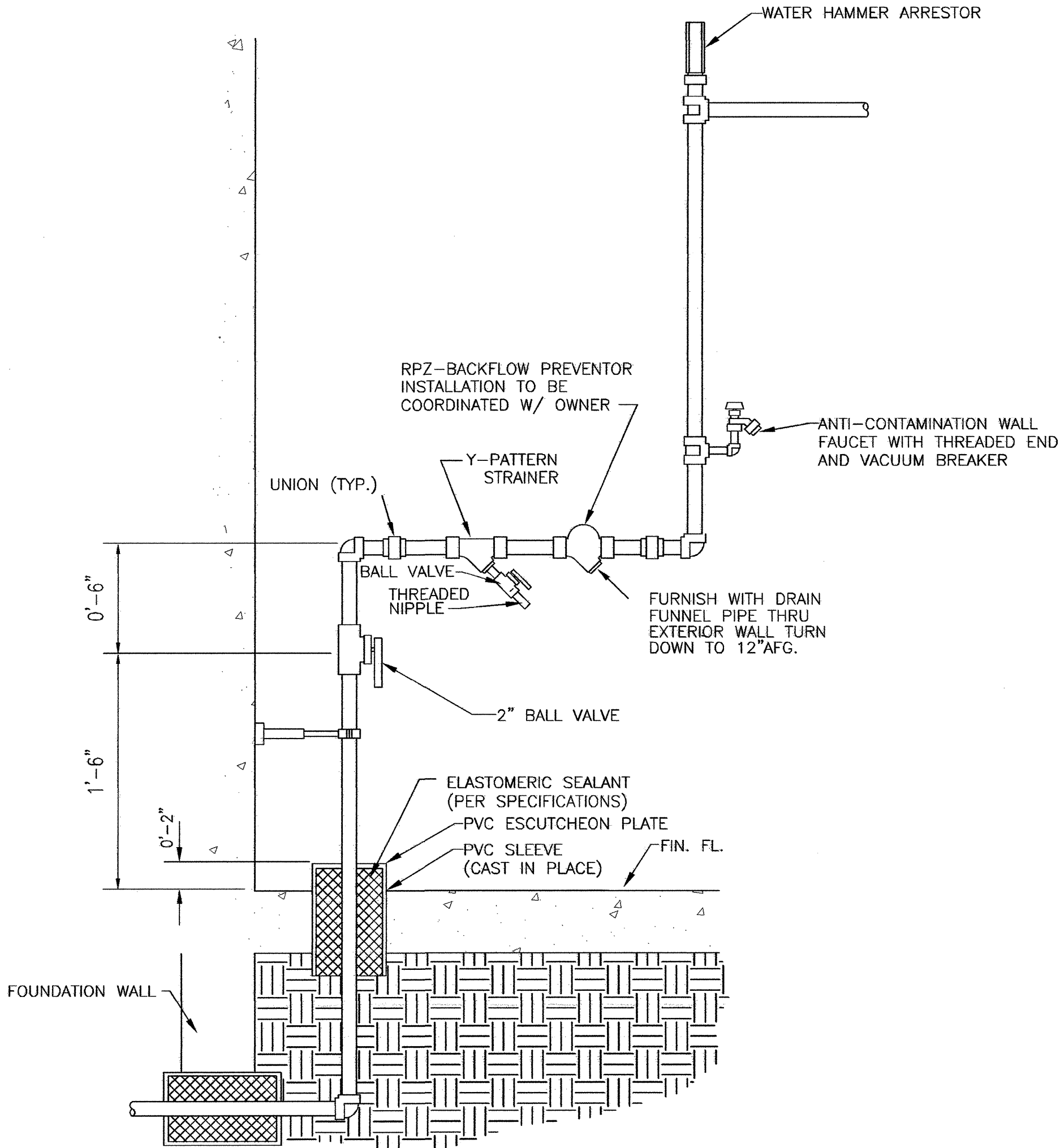


NOTES:

1. CHEMICAL DRAIN PIPE SHALL BE OWNER-PROVIDED "RIBBED FLEXIBLE 2 IN. ACID PIPE", CHEMICAL RESISTANT.
2. STORAGE & OVERFLOW TANKS: SHALL BE CHEMICAL RESISTANT, OPAQUE PLASTIC WITH SEALED GASKETED TOPS EQUIPPED WITH PRESSURE EQUALIZATION VALVES.

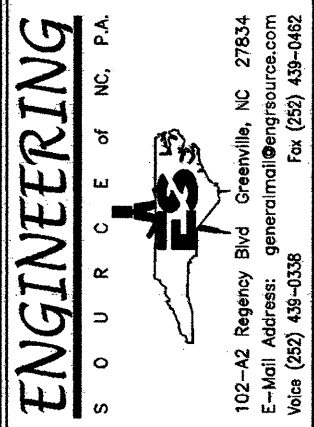
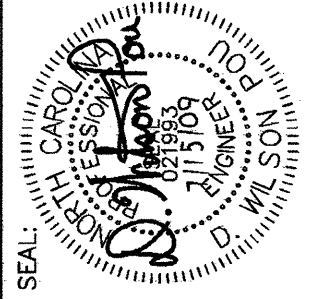
TANK DETAIL

SCALE: N.T.S.



COLD WATER RISER DETAIL

SCALE: N.T.S.



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PROJECT: BURGAW ROADSIDE STORAGE  
SHELTER RENOVATION  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA

SCO PROJECT NO.  
07-07006-02A  
ES JOB NO.  
ES08033

REVISIONS  
06-10-09  
SCO COMMENTS AND  
DESIGN CHANGES

DATE ISSUED: 05-02-08

DRAWN BY: CLB

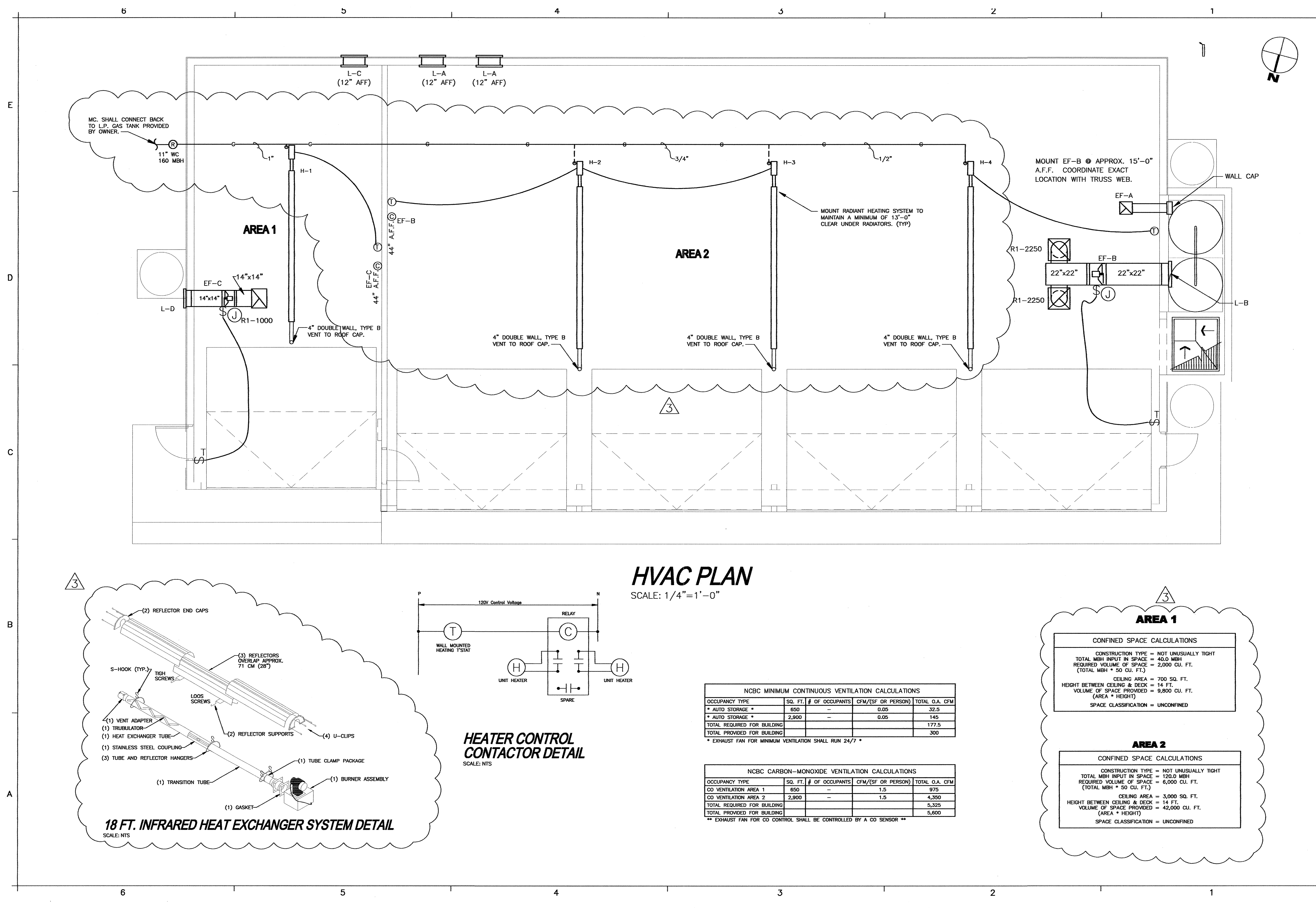
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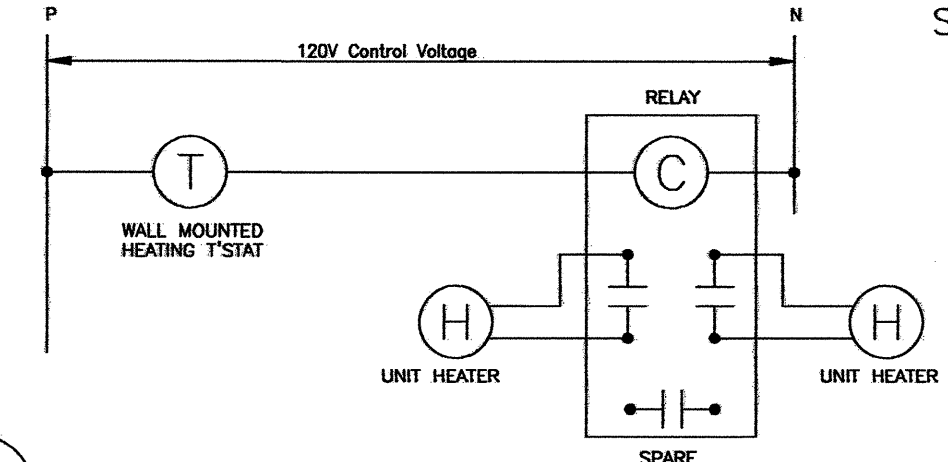
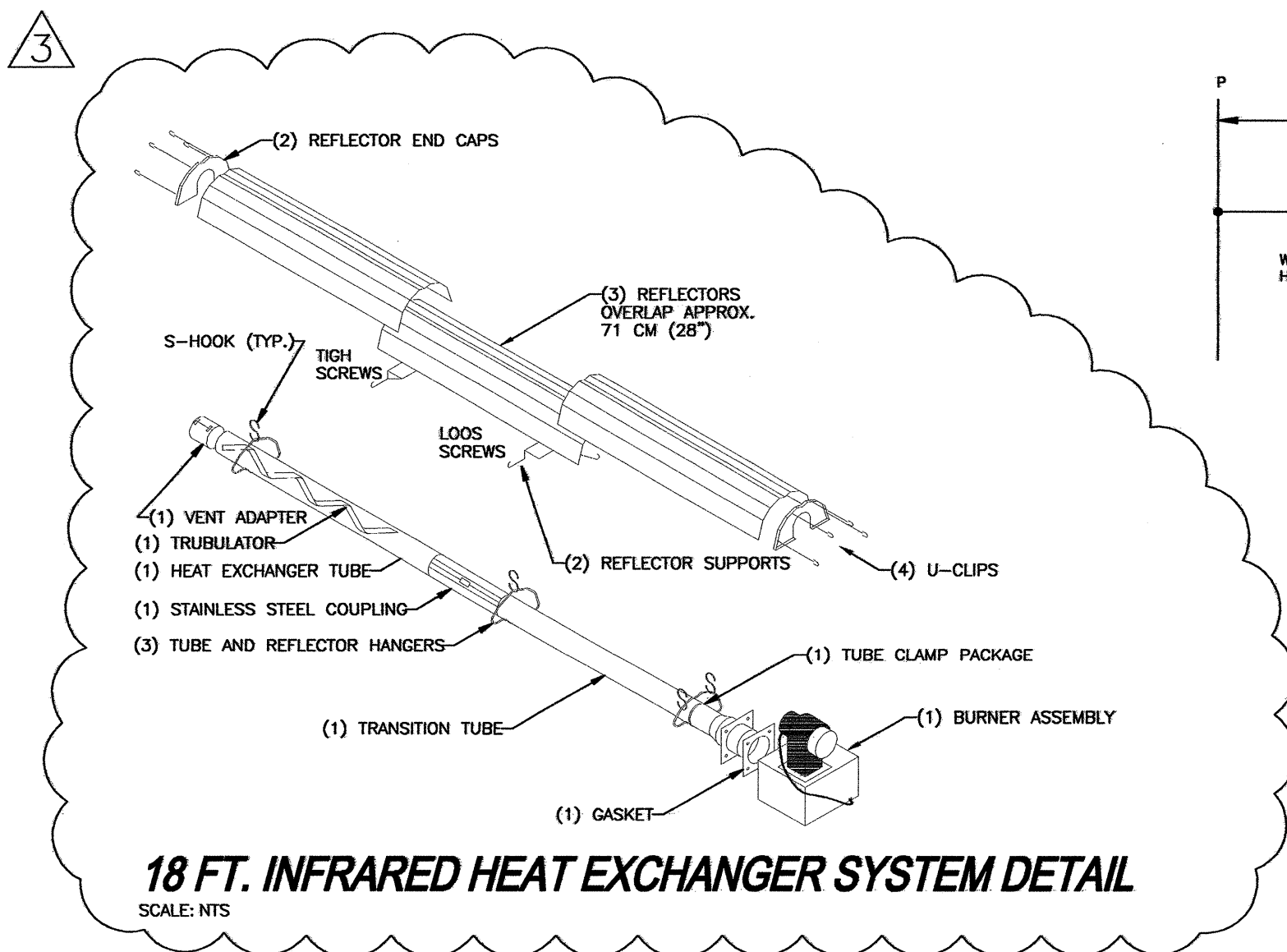
OF





# HVAC PLAN

SCALE: 1/4"=1'-0"



## HEATER CONTROL CONTACTOR DETAIL

SCALE: NTS

NCBC MINIMUM CONTINUOUS VENTILATION CALCULATIONS				
OCCUPANCY TYPE	SQ. FT.	# OF OCCUPANTS	CFM/(SF OR PERSON)	TOTAL O.A. CFM
* AUTO STORAGE *	650	-	0.05	32.5
* AUTO STORAGE *	2,900	-	0.05	145
TOTAL REQUIRED FOR BUILDING				177.5
TOTAL PROVIDED FOR BUILDING				300

\* EXHAUST FAN FOR MINIMUM VENTILATION SHALL RUN 24/7 \*

NCBC CARBON-MONOXIDE VENTILATION CALCULATIONS				
OCCUPANCY TYPE	SQ. FT.	# OF OCCUPANTS	CFM/(SF OR PERSON)	TOTAL O.A. CFM
CO VENTILATION AREA 1	650	-	1.5	975
CO VENTILATION AREA 2	2,900	-	1.5	4,350
TOTAL REQUIRED FOR BUILDING				5,325
TOTAL PROVIDED FOR BUILDING				5,600

\*\* EXHAUST FAN FOR CO CONTROL SHALL BE CONTROLLED BY A CO SENSOR \*\*

### AREA 1

CONFINED SPACE CALCULATIONS

CONSTRUCTION TYPE = NOT UNUSUALLY TIGHT  
TOTAL MBH INPUT IN SPACE = 40.0 MBH  
REQUIRED VOLUME OF SPACE = 2,000 CU. FT.  
(TOTAL MBH \* 50 CU. FT.)

CEILING AREA = 700 SQ. FT.  
HEIGHT BETWEEN CEILING & DECK = 14 FT.  
VOLUME OF SPACE PROVIDED = 9,800 CU. FT.  
(AREA \* HEIGHT)

SPACE CLASSIFICATION = UNCONFINED

### AREA 2

CONFINED SPACE CALCULATIONS

CONSTRUCTION TYPE = NOT UNUSUALLY TIGHT  
TOTAL MBH INPUT IN SPACE = 120.0 MBH  
REQUIRED VOLUME OF SPACE = 6,000 CU. FT.  
(TOTAL MBH \* 50 CU. FT.)

CEILING AREA = 3,000 SQ. FT.  
HEIGHT BETWEEN CEILING & DECK = 14 FT.  
VOLUME OF SPACE PROVIDED = 42,000 CU. FT.  
(AREA \* HEIGHT)

SPACE CLASSIFICATION = UNCONFINED

SEAL: [Stamp]

**ENGINEERING**  
S O U R C E S I N C . P A.  
103-42 Regency Blvd., Charlotte, NC 27834  
E-Mail Address: general@burcawdesign.com  
Web: (252) 439-0338 Fax: (252) 439-0338

PROJECT: **BURCAW ROADSIDE STORAGE SHELTER RENOVATION**

SCO PROJECT NO. 07-07006-02A

ES JOB NO. ES08033

REVISIONS

- 06-10-09 SCO-1
- 08-14-09 SCO-2
- 03-16-10

DATE ISSUED: 05-02-08

DRAWN BY: DWP

CHECKED BY: CLB

SHEET NO. **M1.1**

OF

**FACILITIES DESIGN**  
ARCHITECTS & ENGINEERS  
GENERAL SERVICES DIVISION, NCDOT

1 SOUTH WILMINGTON STREET  
919/715-0400 FAX: 919/715-0399  
RALEIGH, NORTH CAROLINA 27601

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION



MECHANICAL GENERAL NOTES:

1. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE NC BUILDING CODE & CONTR. SHALL NOTIFY ENGINEER IN WRITING REGARDING ANY CODE DISCREPANCIES FOUND ON PLANS. CONTR. IS RESPONSIBLE FOR PERMITS, INSPECTIONS AND FEES.
2. SYSTEMS INDICATED ON PLANS ARE DIAGRAMMATIC IN NATURE. CONTRACTOR SHALL PROVIDE NECESSARY HANGERS, FASTENERS ETC. TO PROVIDE A COMPLETE AND WORKING SYSTEM.
3. CONTRACTOR SHALL SEAL ALL DUCTWORK WITH A PAINT ON MASTIC. ALL WALL PENETRATIONS SHALL BE SEALED AIR TIGHT.
4. CONTRACTOR SHALL FIELD MEASURE ACTUAL INSTALLED CONDITIONS AND COORDINATE DUCT SIZES PRIOR TO FABRICATION OR INSTALLATION OF EQUIP. & DUCTWORK.
5. CONTRACTOR SHALL COORDINATE ALL DUCTWORK, DIFFUSER AND GRILLE LOCATION WITH OTHER CEILING MOUNTED DEVICES SHOWN.
6. LOCATE THERMOSTATS AND TEMPERATURE SENSORS AT 4'-0" A.F.F. IN LOCATION INDICATED ON PLANS.
7. ALL DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS.
8. CONTRACTOR SHALL COORDINATE ALL WALL, ROOF AND FLOOR PENETRATION LOCATIONS AND SIZES.
9. FABRICATE AND INSTALL ALL DUCT WORK PER SMACNA 1.5" W.C. PRESSURE. ALL ELBOWS SHALL HAVE 1.5R CENTERLINE.
10. EXHAUST DUCT SHALL NOT BE INSULATED.
11. ALL DUCTWORK AND PIPING SHALL BE CONCEALED ABOVE CEILINGS, IN ATTICS, TRUSSES AND SOFFITS EXCEPT WHERE NOTED OTHERWISE.
12. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL FINAL POWER AND CONTROL CONNECTIONS TO HIS EQUIPMENT. (SEE DETAIL)
13. MECHANICAL CONTRACTOR SHALL LABEL ALL EQUIPMENT WITH ENGRAVED PLASTIC LAMINATE, SCREWED TO PIECE OF EQUIPMENT.
14. ALL GAS PIPE AS SHOWN SHALL BE SCHEDULE 40 BLACK STEEL PAINTED OSHA YELLOW OR FLEXIBLE STAINLESS STEEL LABELED "LP GAS".

EXHAUST FAN SEQUENCE OF OPERATION:

MINIMUM CONTINUOUS VENTILATION:  
EXHAUST FAN TYPE "A" IS A CEILING MOUNTED CABINET VENTILATOR SELECTED TO PROVIDE A MINIMUM OF 0.05 CFM PER SF OF THE ENTIRE BUILDING. IT SHALL RUN CONTINUOUSLY AND ONLY BE TURNED OFF FOR MAINTENANCE, SERVICE OR REPLACEMENT.

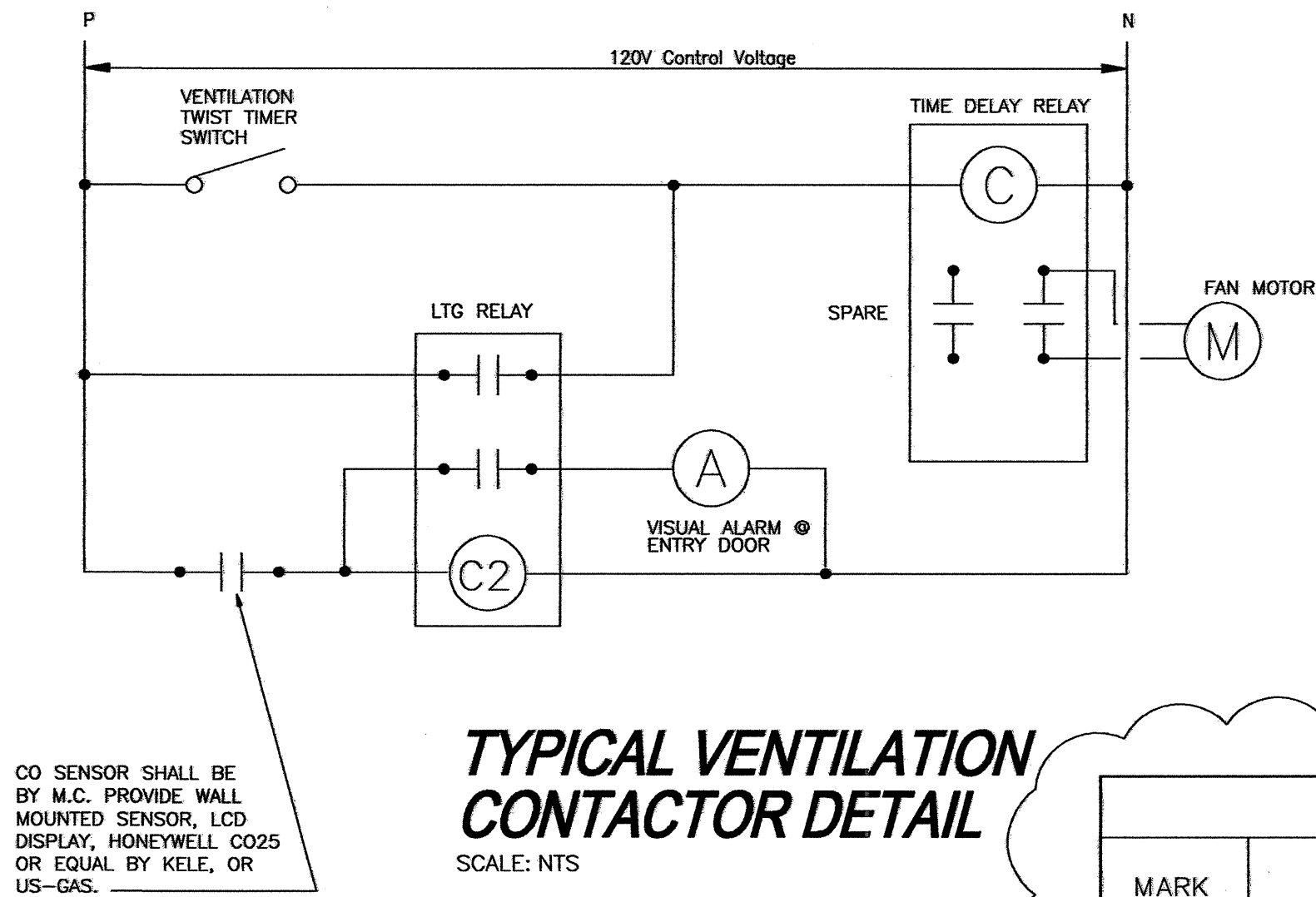
CARBON MONOXIDE EVACUATION:  
TYPE "B" EXHAUST FANS ARE CEILING MOUNTED CABINET VENTILATOR. THEY WERE SELECTED TO PROVIDE A MINIMUM OF 1.5 CFM PER SF OF THE RESPECTIVE CONTROL AREAS THAT THEY EACH SERVE. THESE FANS SHALL BE CONTROLLED BY A SPACE CARBON MONOXIDE SENSOR SET FOR (25 PPM). UPON SENSING A CO CONCENTRATION ABOVE SET POINT THE FAN SHALL BE ENERGIZED AND THE GRAVITY INTAKE DAMPERS WILL OPEN TO ALLOW AIR TO ENTER THE SPACE. UPON SENSING A CONCENTRATION BELOW SET POINT THE FAN SHALL RUN FOR AN ADDITIONAL 10 MINUTES THEN SHUT DOWN, AND THE DAMPERS WILL CLOSE. FANS SHALL ALSO RUN ON DEMAND THROUGH A TWIST TIMER SWITCH LOCATED AT THE ENTRANCE DOOR. (SEE WIRING DETAIL THIS SHEET)

AIR DISTRIBUTION						
MARK	MAX. CFM	FRAME	NECK SIZE	MODEL	MANUF.	REMARKS
R1	2250	GYP BRD	22x22	80TB	PRICE	1,2,4,5

1. COORDINATE CEILING RATINGS WITH ARCH PLANS. PROTECT GRILLES AS NECESSARY.
2. NC SHALL NOT EXCEED NC 35.
3. MAX. SP SUPPLY - 0.10" W.G.
4. MAX. SP RETURN/EXHAUST - 0.06" W.G.
5. ALL RUN-OUTS AND FLEX TO BE EQUAL TO NECK SIZE FOR SUPPLY.
6. EQUALS BY METALAIR, CARNES, KREUGER, & TUTTLE-BAILEY ARE ACCEPTABLE.

FAN SCHEDULE										
SYMBOL	PURPOSE	DESIGN BASIS	SERVICE	TYPE ASSEMBLY	CFM	SP (IN. W.G.)	DRIVE TYPE	BHP/WATTS	VOLT/PH	REMARKS
EF-A	MIN. VENTILATION	GREENHECK/SPA-290	EXHAUST	CABINET FAN	300	.100	DIRECT	80 W	120/1	1,2,4
EF-B	CAR-MON PURGE	GREENHECK/BDF-150	EXHAUST	IN-LINE FAN	4,600	.100	BELT	2	120/1	1,2,3,4
EF-C	CAR-MON PURGE	GREENHECK/BDF-80	EXHAUST	IN-LINE FAN	1,000	.100	BELT	0.34 BHP	120/1	1,2,3,4

1. BACKDRAFT DAMPER AND WALL CAP.
2. UNIT MOUNTED DISCONNECT SWITCH.
3. PROVIDE FAN WITH CARBON-MONOXIDE SENSOR CONTROL.
4. EQUALS BY COOK, ACME, CARNES AND IILG SHALL BE ACCEPTABLE.
5. PROVIDE WITH WALL HOUSING, INTAKE GRILLE, GRAVITY DAMPER AND WEATHERHOOD ACCESSORIES.



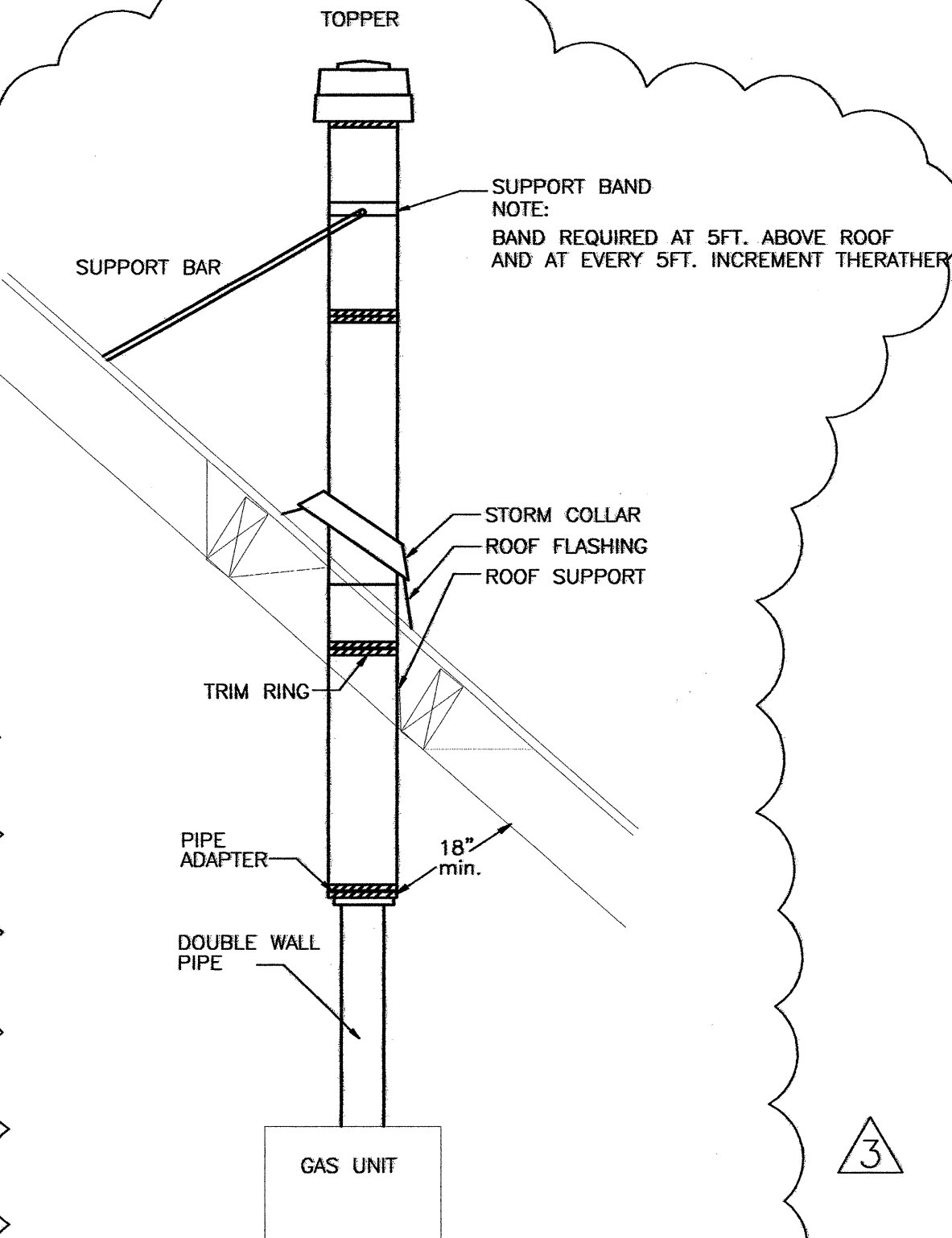
TYPICAL VENTILATION CONTACTOR DETAIL  
SCALE: NTS

LOUVER SCHEDULE							
MARK	SIZE (W X H)	MANUF.	PD	SERVICE	CFM	MODEL NUMBER	REMARKS
L-A	14x96	RUSKIN	0.05	INTAKE	2,250	ELF375DX	1,2,3,4
L-B	30x30	RUSKIN	0.20	EXHAUST	4,500	ELF375DX	1,2,3,4
L-C	14x42	RUSKIN	0.05	INTAKE	1,000	ELF375DX	1,2,3,4
L-D	24x24	RUSKIN	0.05	EXHAUST	1,000	ELF375DX	1,2,3,4

1. BASIS OF DESIGN IS RUSKIN, EQUALS BY ARROW & NCA ARE ACCEPTABLE.
2. COORDINATE EXACT SIZE AND LOCATION WITH ARCH. ELEV.
3. PARAMETRIC GRAVITY DAMPER SHALL HAVE RUBBER END & EDGE SEALS.
4. LOUVERS SHALL BE CLEAR ANODIZED ALUMINUM.

GAS INFRARED HEATER SCHEDULE						
MARK	MAKE	MODEL	AMP DRAW	VOLT	BTU INPUT	NOTES
H-1,2,3,4	SPACE-RAY	LTU 40	2.6	120V	40,000	1,2,3,4

1. T'STAT RANGE OF 45°F TO 65°F
2. PROVIDE SPACE-RAY, ROBERTS-GORDON, DETROIT RADIANT OR DAYTON.
3. GAS TYPE: PROPANE.
4. M.C. SHALL PROVIDE UNIT WITH DRAFT INDUCER ASSEMBLY.



\*GAS VENT TERMINATION SHALL EXTEND AT LEAST (3) THREE FEET ABOVE THE HIGHEST POINT WHERE IT PASSES THROUGH THE ROOF AND AT LEAST (2) TWO FEET HIGHER THAN ANY PORTION OF THE BUILDING WITHIN A HORIZONTAL DISTANCE OF TEN FEET (SEE FIGURE 503.5.4 OF 2006 NC FUEL GAS CODE)

TYPE B VENTILATION  
SCALE: NTS

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT  
METHOD OF COMPLIANCE:

PRESCRIPTIVE ☒ ENERGY COST BUDGET ☐

THERMAL ZONE: IBC - 6B

EXTERIOR DESIGN CONDITIONS

WINTER DRY BULB: 20°F  
SUMMER DRY BULB: 92°F

INTERIOR DESIGN CONDITIONS

WINTER DRY BULB: 70°F  
SUMMER DRY BULB: 75°F  
RELATIVE HUMIDITY: 50%

BUILDING HEATING LOAD: 183.6 MBH

BUILDING COOLING LOAD: N/A

MECHANICAL SPACE CONDITIONING SYSTEM

UNITARY  
DESCRIPTION OF UNIT: N/A  
HEATING EFFICIENCY: N/A  
COOLING EFFICIENCY: N/A  
HEAT OUTPUT OF UNIT: SEE SCHEDULE  
COOLING OUTPUT OF UNIT: SEE SCHEDULE

BOILER  
TOTAL BOILER OUTPUT: (If oversized, state reason)  
CHILLER  
TOTAL CHILLER OUTPUT: (If oversized, state reason)

LIST EQUIPMENT EFFICIENCIES

EQUIPMENT SCHEDULES WITH MOTORS (Not used for mechanical systems)

MOTOR HORSEPOWER:  
NUMBER OF PHASES:  
MINIMUM EFFICIENCY:  
MOTOR TYPE:  
# OF POLES:

DESIGNER STATEMENT:

To the best of my knowledge and belief, the design of this building complies with the mechanical systems, service systems and equipment requirements of the North Carolina Building Code Volume X - Energy

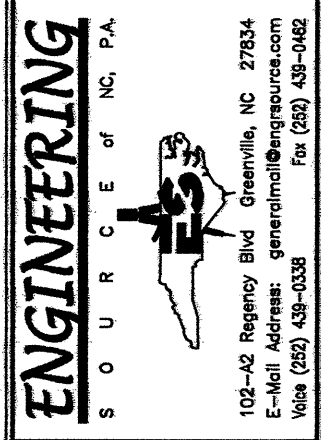
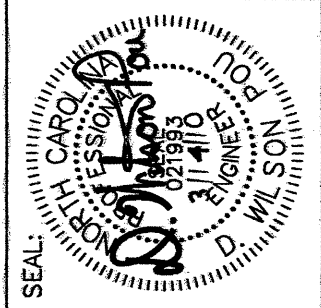
SIGNED: *D. Wilson POU*

NAME: D. WILSON POU, P.E.

TITLE: PRESIDENT

MECHANICAL LEGEND

- G.C. GEN. CONTR.
- E.C. ELEC. CONTR.
- P.C. PLUMB. CONTR.
- AFF ABOVE FINISH FLOOR
- AFG ABOVE FINISH GRADE
- 18x16 WRAPPED RIGID DUCT
- INSULATED FLEXIBLE DUCT
- SUPPLY DIFFUSER
- RETURN AIR GRILLE
- CEILING EXHAUST GRILLE OR FAN
- 45°F TO 70°F HEATING THERMOSTAT & UNIT SERVED.
- A-400 DIFFUSER TYPE-CFM
- MANUAL DAMPER
- INSTALL PER MFG. INSTALLATION.
- DUCT MOUNTED SMOKE DETECTOR PROVIDED AND WIRED BY E.C., INSTALLED BY M.C., MC RESPONSIBLE FOR ACCESS PANELS
- CONN. TO EXIST.
- GAS PIPING
- FD SPRING LOADED FIRE DAMPER
- CE-B CO SENSOR (25 PPM) & UNIT SERVED. MTG. HEIGHT 44"
- TT TWIST TIMER SWITCH
- M 120V MOTORIZED DAMPER



PROJECT: BURGAW ROADSIDE STORAGE SHELTER RENOVATION  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA  
1 SOUTH WILMINGTON STREET  
919/715-0400 FAX: 919/715-0399  
RALEIGH, NORTH CAROLINA 27601



PROJECT: BURGAW ROADSIDE STORAGE SHELTER RENOVATION  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA

SCO PROJECT NO. 07-07006-02A  
ES JOB NO. ES08033

REVISIONS

06-10-09 SCO-1

08-14-09 SCO-2

03-16-10

DATE ISSUED: 06-02-08

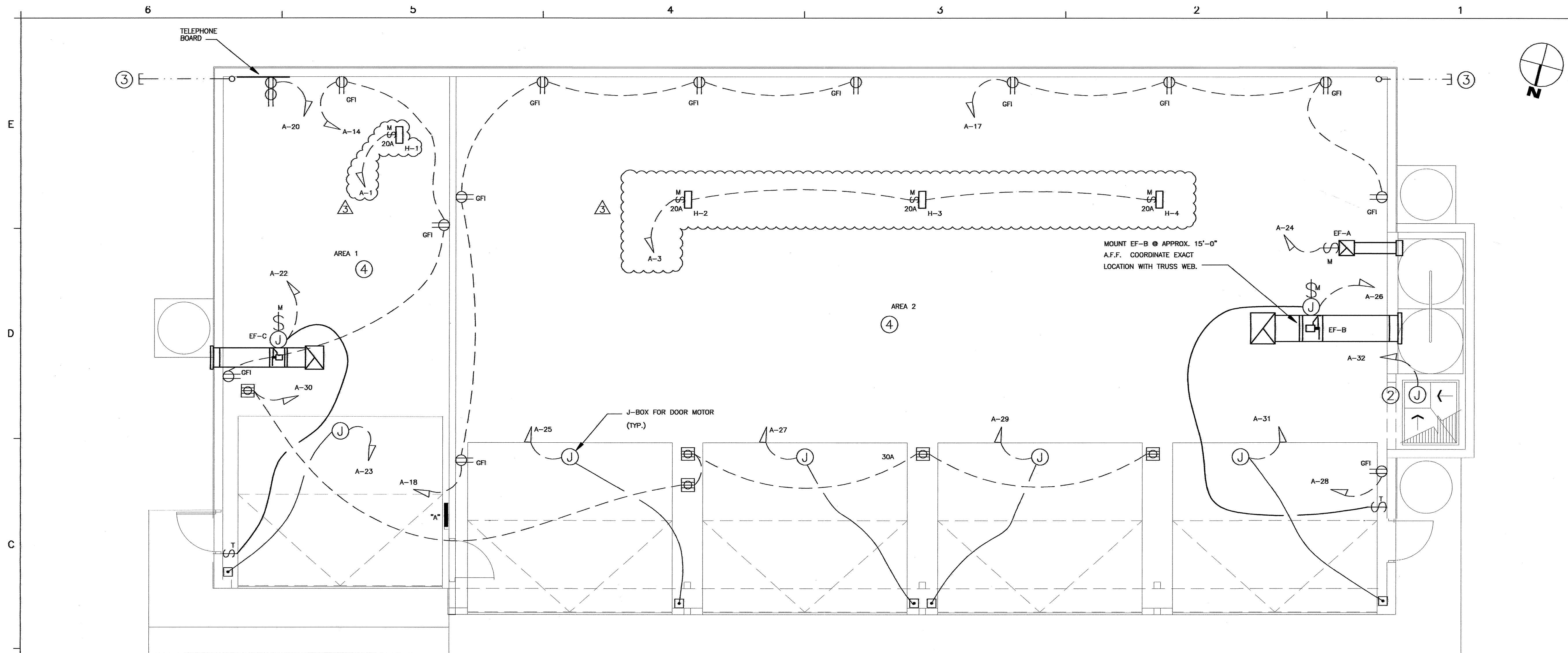
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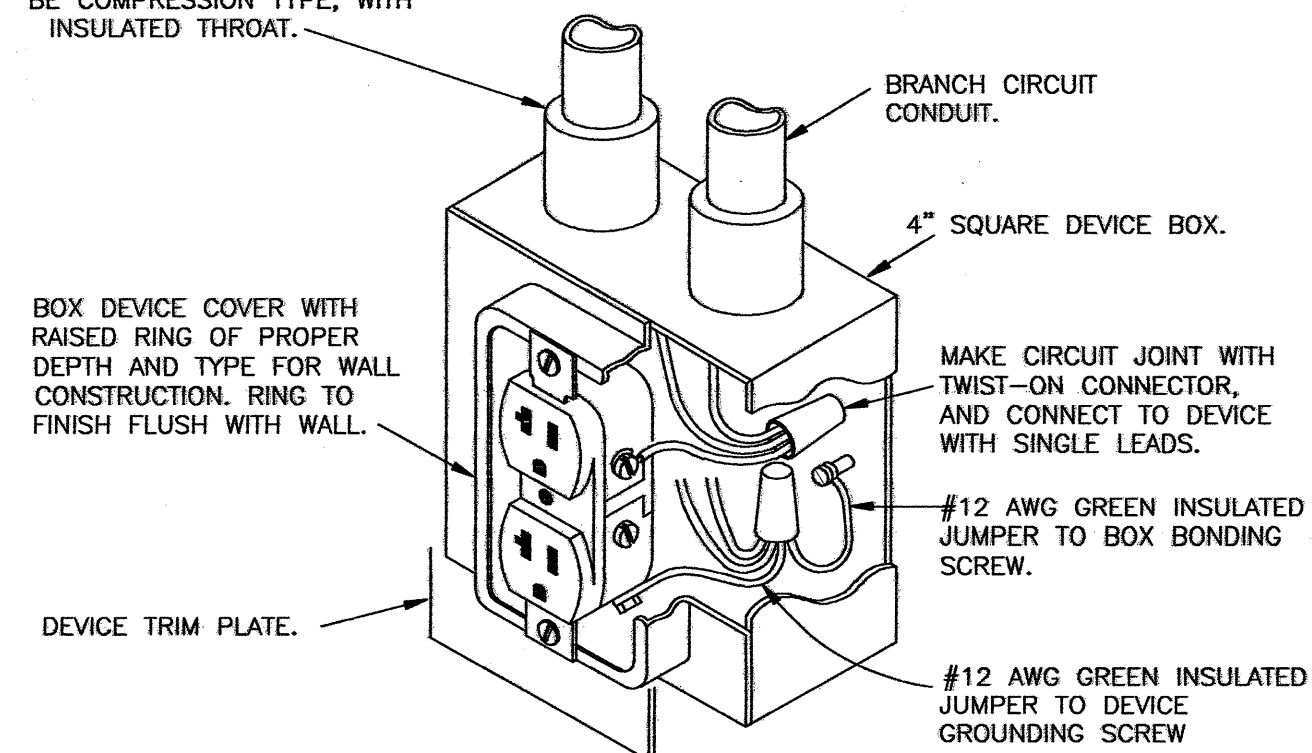
SHEET NO. M2.1

OF





FOR EMT, CONNECTORS SHALL BE COMPRESSION TYPE, WITH INSULATED THROAT.



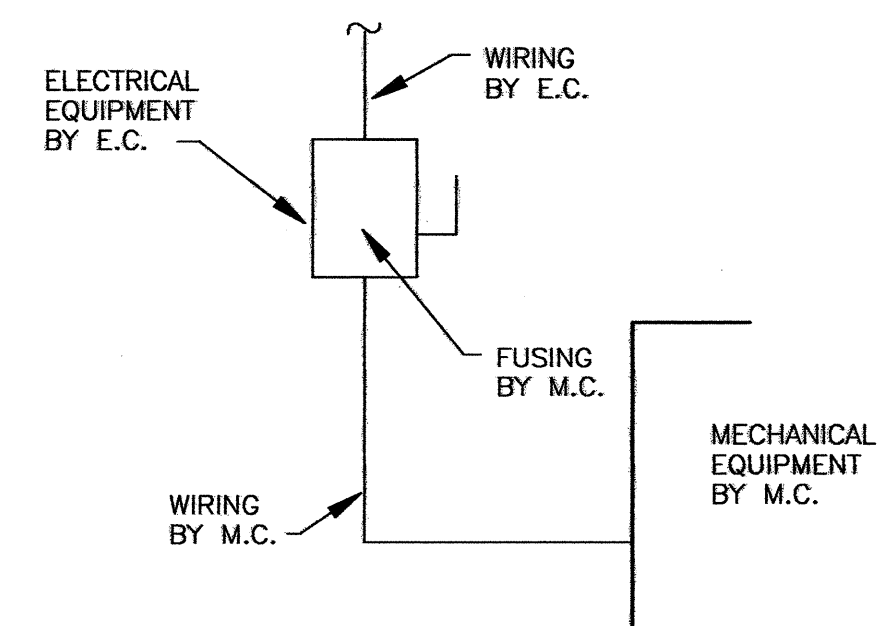
**TYPICAL DUPLEX RECEPTACLE INSTALLATION**  
SCALE: NONE

## POWER PLAN

SCALE: 1/4"=1'-0"

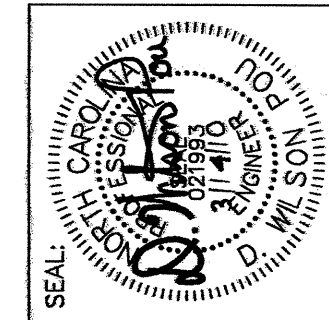
### POWER PLAN NOTES:

- E.C. SHALL REFER TO MECHANICAL PLAN M1.1 FOR ELECTRICAL UNIT HEATER SPECIFICATIONS
- E.C. SHALL VERIFY EXACT SPECIFICATIONS FOR SUMP PUMP PRIOR TO INSTALLATION. MODIFY BREAKER AND WIRE SIZE AS NECESSARY.
- E.C. SHALL PROVIDE AN EMPTY 1" CONDUIT, WITH PULL STRING, UNDER SLAB TO EXTERIOR OF BUILDING BEYOND SIDEWALK, APPROXIMATELY 10'-0". CAP CONDUIT AT BOTH ENDS.
- E.C. SHALL COORDINATE UNIT HEATER LOCATIONS WITH LIGHTS AND OVERHEAD DOORS WHEN OPENED, AND COMPLY WITH ALL MANUFACTURER'S INSTALLATION REQUIREMENTS.

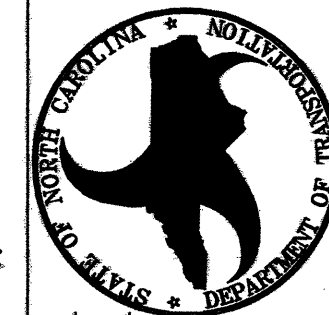


## ELECTRICAL CONNECTION DETAIL

SCALE: N.T.S.



**FACILITIES DESIGN**  
ARCHITECTS & ENGINEERS  
GENERAL SERVICES DIVISION, NCDOT  
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919/715-0400 FAX: 919/715-0399  
RALEIGH, NORTH CAROLINA 27601



**PROJECT:** BURGAW ROADSIDE STORAGE  
SHELTER RENOVATION  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA

SCO PROJECT NO.  
07-07006-02A

ES JOB NO.  
ES08033

### REVISIONS

06-10-09 SCO-1

08-14-09 SCO-2

03-16-10

DATE ISSUED: 08-02-08

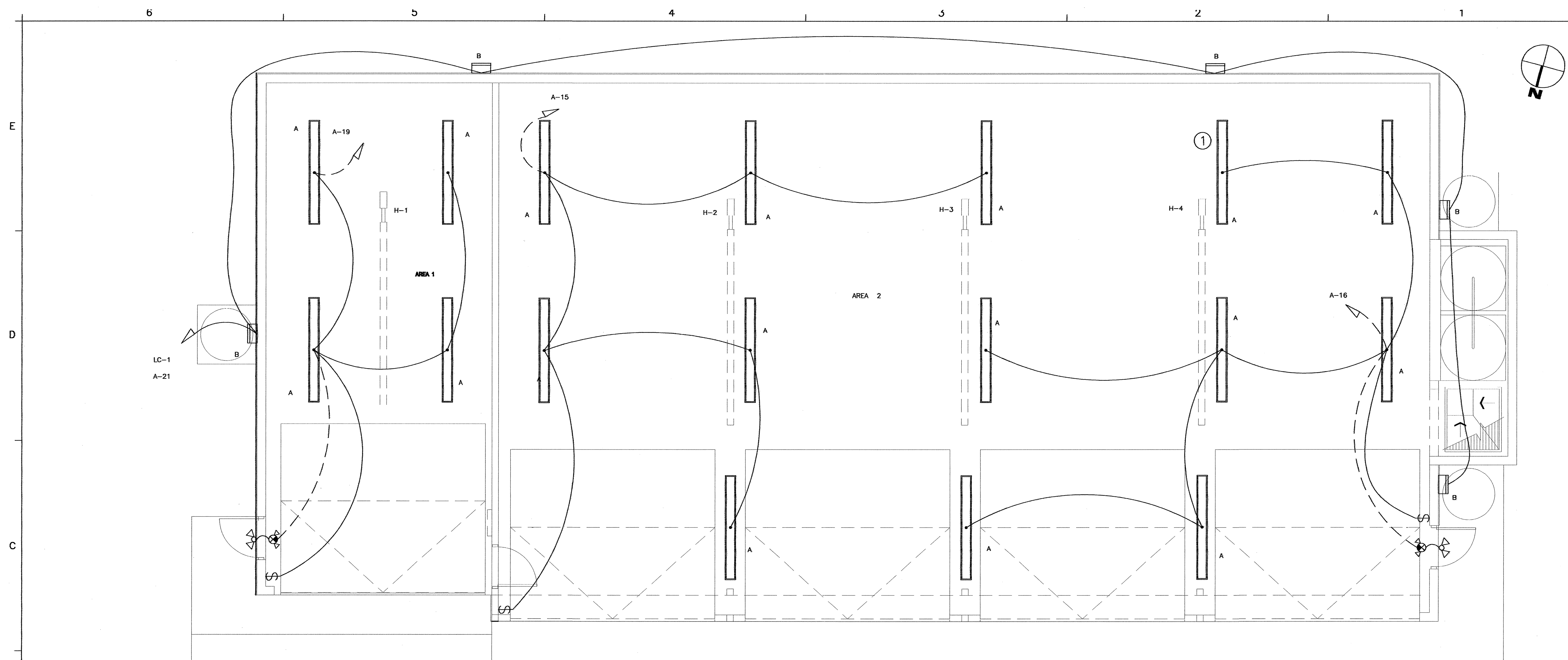
DRAWN BY: DWP

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SHEET NO. 1

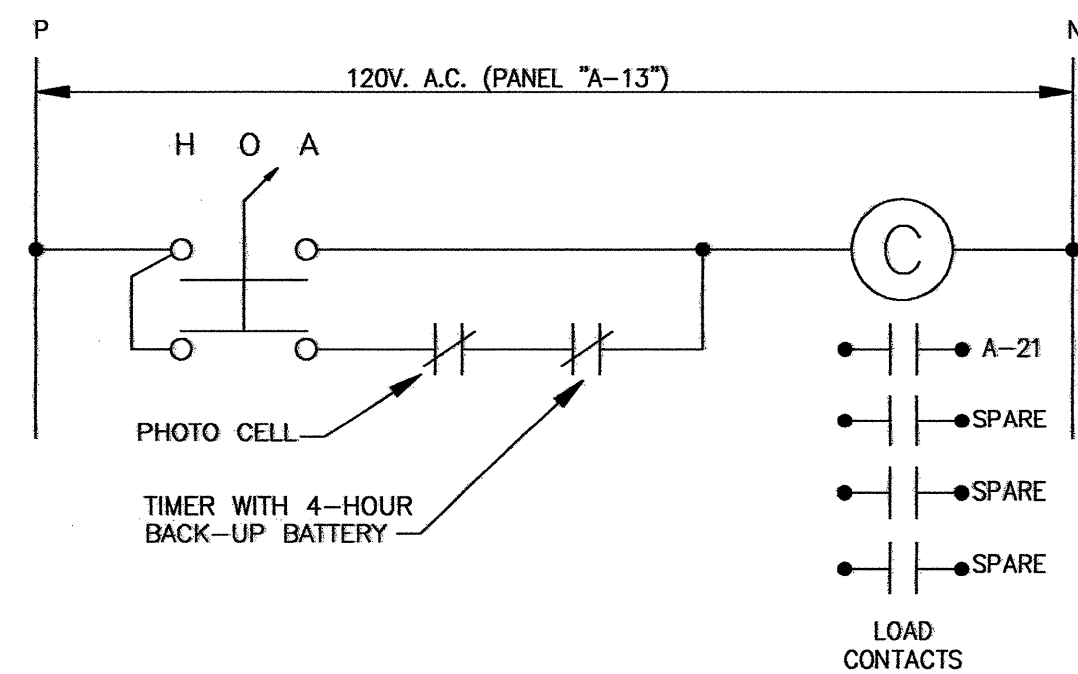
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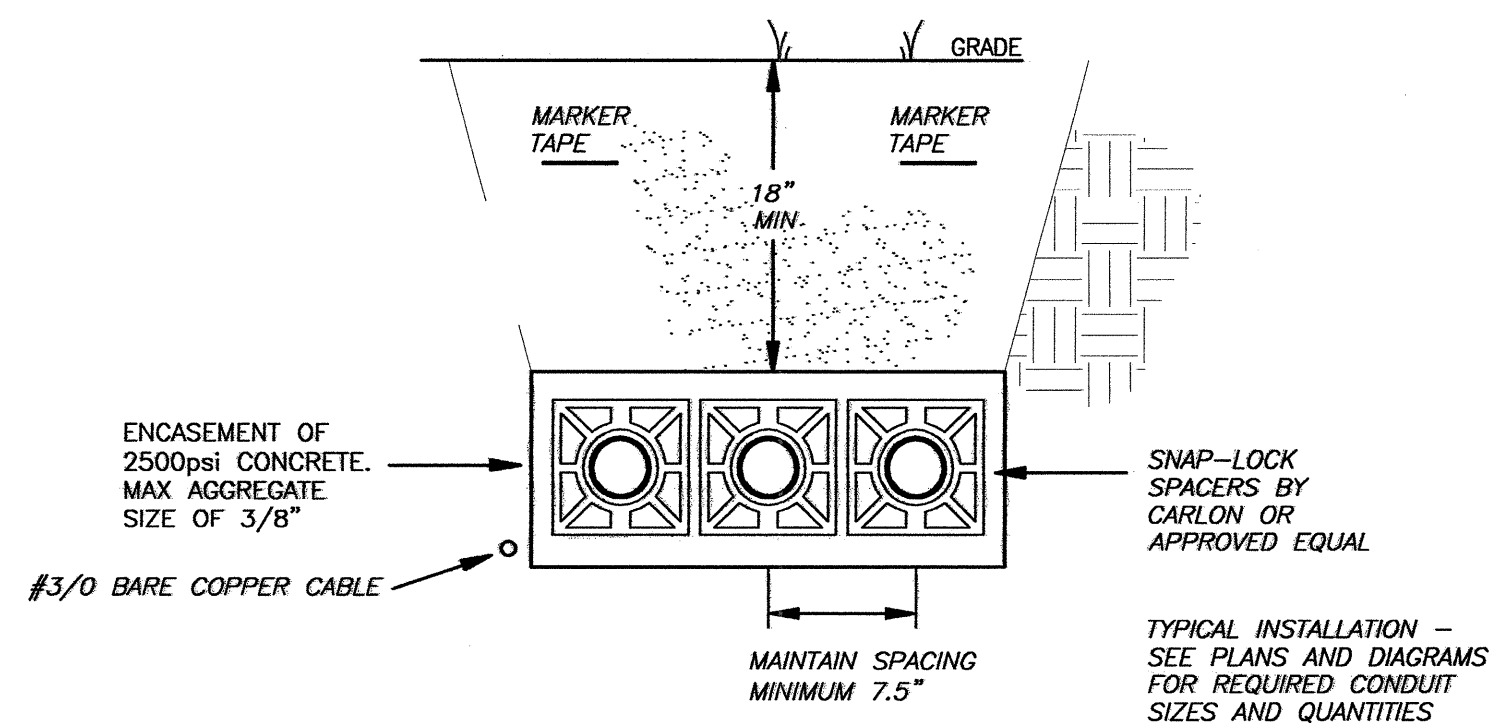
## LIGHTING PLAN

SCALE: 1/4"=1'-0"



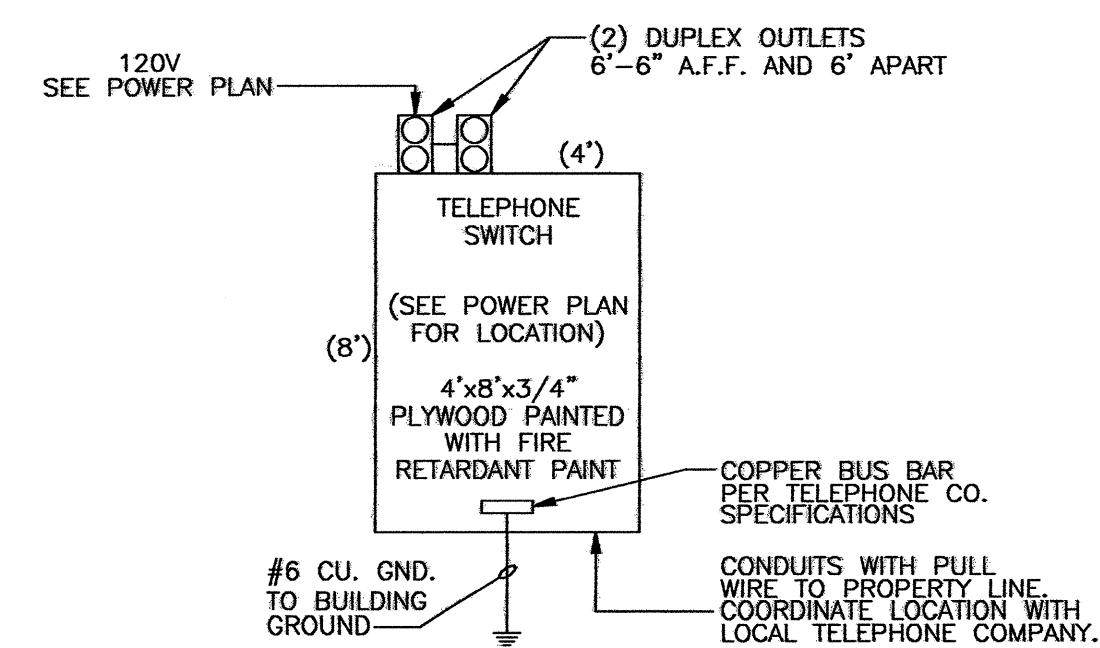
### LIGHTING CONTACTOR LC-1 DETAIL

SCALE: NTS



### U/G POWER & TELE FEEDER INSTALLATION DETAIL

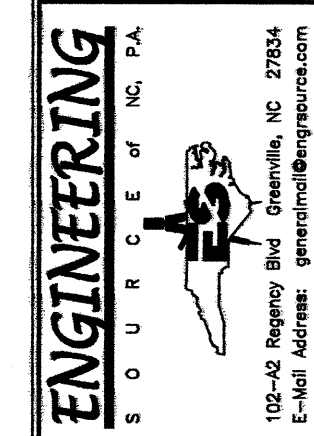
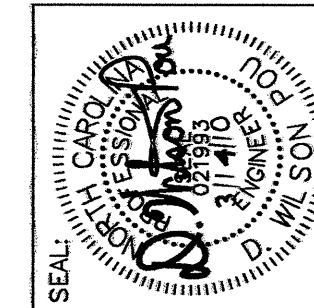
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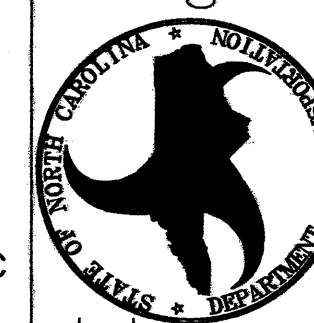
NOTE:  
SECURE SPECS FROM LOCAL TELEPHONE CO. AS TO THEIR REQUIREMENTS  
REGARDING INSTALLATION OF UNDERGROUND CONDUITS, GROUNDING, TELEPHONE  
BOARD, ETC. AND PROVIDE AS NECESSARY.

### TELEPHONE BOARD DETAIL

SCALE: NTS



**FACILITIES DESIGN**  
**ARCHITECTS & ENGINEERS**  
GENERAL SERVICES DIVISION, NCDOT  
1 SOUTH WILMINGTON STREET  
919/715-0400 FAX: 919/715-0399  
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**PROJECT:**  
**BURGAW ROADSIDE STORAGE**  
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REVISIONS

06-10-09 SCO-1

08-14-09 SCO-2

03-16-10

DATE ISSUED: 09-02-08

DRAWN BY: DWP

CHECKED BY:

SHEET NO.  
E1.2

OF



### ELECTRICAL NOTES:

- DO NOT SCALE THESE DRAWINGS; REFER TO LARGEST SCALE ARCHITECTURAL PLANS.
- THESE DRAWINGS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW MINOR DETAILS AND EXACT LOCATIONS. DESIGN ADJUSTMENTS SHALL BE ANTICIPATED BY THE CONTRACTOR TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH CURRENT NEC/NFPA 70. CONTRACTOR SHALL NOTIFY ENGINEER REGARDING ANY CODE DISCREPANCIES SHOWN ON PLAN. SCHEDULING OF ELECTRICAL INSPECTIONS WITH THE NCDOT INSPECTOR IN THIS AREA IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- CONTRACTOR SHALL INSTALL, GROUND AND BOND SYSTEM PER THE CURRENT NEC.

- CONTRACTOR SHALL NOT PUT MORE THAN SIX (6) DUPLEX RECEPTACLES ON ANY GIVEN 1P-20A CIRCUIT UNLESS SHOWN OTHERWISE.

- MINIMUM WIRE SIZE SHALL BE #12 AWG., MINIMUM CONDUIT SIZE SHALL BE 3/4".

- LIGHTING SWITCHES, RECEPTACLES AND/OR DATA OUTLETS SHALL NOT BE MOUNTED BACK TO BACK IN ANY WALL.

- ELECTRICAL CONTRACTOR SHALL PROVIDE HACR RATED CIRCUIT BREAKERS ON ALL HVAC EQUIPMENT.

- CONDUCTORS SHALL BE TYPE THHN OR THWN. BRANCH CIRCUIT CONDUCTOR SHALL NOT BE SMALLER THAN No. 12 AWG., EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE. HOME RUNS ORIGINATING MORE THAN 80' AT 120V FROM PANEL LOCATION SHALL BE No. 10 AWG MINIMUM SIZE. WIRES No. 10 AWG AND SMALLER SHALL BE SOLID COPPER; WIRES No. 8 AWG AND LARGER SHALL BE STRANDED COPPER. PROVISIONS OF SECTION 210-5 COLOR CODE, NEC, SHALL BE STRICTLY COMPLIED WITH AND BE CONSISTENT THROUGHOUT ENTIRE SYSTEM.

- ALL CIRCUITS SHALL BE PROVIDED WITH AN INSULATED EQUIPMENT GROUND. CONDUITHS SIZED IN ACCORDANCE WITH CURRENT NEC TABLE 250-122. HASHMARK FOR GROUNDING CONDUCTOR IS NOT INDICATED ON THESE DRAWINGS. RACEWAY SHALL NOT BE USED AS EQUIPMENT GROUND.

- ALL CONDUIT SHALL BE CONCEALED UNLESS OTHERWISE NOTED. ALL EMPTY CONDUIT SHALL HAVE A PULL WIRE.

- SERVICE ENTRANCE CONDUCTORS SHALL BE IN CONDUIT (RIGID OR PVC). EXTERIOR CONDUIT EXPOSED ABOVE SLAB SHALL BE RIGID. INTERIOR CONDUIT EXPOSED SHALL BE ELECTRICAL METALLIC TUBING (EMT). EMT SHALL BE COLD-ROLLED STEEL TUBING w/A COATING ON THE OUTSIDE AND PROTECTED ON THE INSIDE BY A ZINC, ENAMEL, OR EQUIVALENT CORROSION RESISTANT COATING AND CONFORMING TO THE REQUIREMENTS OF ANSI C 80.3-1996 OR LATER EDITION. ALL UNDERGROUND CONDUIT SHALL BE UL LISTED SCHD 40 PVC CONFORMING TO ARTICLES 352 & 300 OF THE NEC. WHERE SCHD 40 PVC IS INSTALLED BELOW GRADE OR UNDER FLOOR SLABS, THE ELBOWS REQUIRED TO TURN THE RACEWAY UP INTO CABINETS, EQUIPMENT, ETC., SHALL BE OF RIGID STEEL AND SHALL CONTINUE AS RIGID STEEL TO THE CABINET, EQUIPMENT, ETC. FEEDER CIRCUITS SHALL BE IN CONDUIT.

- ALL JUNCTION OR DEVICE BOXES SHALL HAVE A COVER.

- ALL 1P-20A CIRCUITS SHALL BE 2-#12 & 1-#12G IN 3/4" U.N.O.

- ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL VOLUMES OF THE NCDOT HAVING JURISDICTION, AND ALL OTHER APPLICABLE CODES AND ORDINANCES. E.C. IS RESPONSIBLE FOR COORDINATING ALL INSPECTIONS WITH THE STATE ELECTRICAL INSPECTOR FOR THIS AREA.

- EACH PIECE OF ELECTRICAL GEAR, EQUIPMENT, ETC., SHALL BEAR A "UL" LABEL.

- ROOF DECKING SHALL NOT BE PENETRATED TO SUPPORT ELECTRICAL ITEMS.

- ALL EMERGENCY AND EXIT LIGHTS SHALL BE CONNECTED TO THE UNINTERRUPTED SIDE OF THE LOCAL LIGHTING CIRCUIT.

- INSTALL ENGRAVED PHENOLIC LABELS ON ALL ELECTRICAL GEAR, DISCONNECTS, ETC. FASTEN WITH SCREW FASTENERS.

- E.C. SHALL INSTALL HEAVY DUTY NEMA-1 DISCONNECTS AT ALL INTERIOR LOCATIONS INDICATED AND HEAVY DUTY NEMA-3R DISCONNECTS AT ALL EXTERIOR LOCATIONS INDICATED ON THESE DRAWINGS.

- VERIFY WITH OWNER LOCATION/TYPE OF ALL FIXTURES, PANEL BOXES, OUTLET PLACEMENT, ETC. BY HOLDING AN ELECTRICAL WALKTHROUGH ON THE BUILDING SITE ONCE FRAMING IS COMPLETED.

- ELECTRICAL BOXES INSTALLED IN U.L. RATED WALLS SHALL BE LOCATED A MINIMUM OF 2"-0" FROM ANY OTHER ELECTRICAL BOX IN THAT WALL.

- ELECTRICAL DEVICES (SWITCHES, RECEPT., ETC) SHALL BE BROWN IN COLOR WITH OVERSIZED STAINLESS STEEL COVER PLATES.

- E.C. SHALL PROVIDE GROUNDING SYSTEM TESTS AS REQUIRED BY SCO, PROVIDE TABULATED RESULTS WITH THE PROJECT CLOSE-OUT DOCUMENTATION.

- RECEPTACLES SHALL BE 20 AMP RATED, GROUNDING TYPE WITH HEX HEAD GREEN GROUNDING SCREW. THEY SHALL BE SPECIFICATION OR HEAVY DUTY GRADE.

- EMT FITTING SHALL BE STEEL PLATED COMPRESSION TYPE, NO POT METAL., INDENTER OR SET SCREW FITTING WILL BE ALLOWED.

- E.C. SHALL LABEL EACH ELECTRICAL DEVICE AND PIECE OF GEAR WITH PANEL AND CIRCUIT THAT IT IS FED FROM PER SCO STANDARDS. USE SCO COLOR STANDARDS FOR THE DEVICES' RESPECTIVE VOLTAGES.

### ELECTRICAL EQUIPMENT MOUNTING HEIGHTS

DEVICE	MT HEIGHT	TO
PANEL BOARDS	6'-6" AFF	TOP
TOGGLE SWITCH (GYPBOARD)	4'-0" AFF	C
TOGGLE SWITCH (MASONRY)	4'-0" AFF	TOP
RECEPTACLES	1'-6" AFF	C
RECEPTACLES (AT BASE CABINETS)	7" ACT	C
VOICE/DATA OUTLETS	1'-6" AFF	C
FIRE ALARM PULL STATIONS	4'-6" AFF	TOP
EMERGENCY LIGHTS	12" BFC	TOP
STROBE/HORNS	12" BFC OR 96" AFF MAX	TOP
REMOTE ANNUNCIATOR PANEL	4'-8" AFF	C
THERMOSTATS	4'-0" AFF	C
MANUAL SHUTDOWN SWITCHES (HVAC)	4'-0" AFF	C

- NOTES:
- TYPICAL MOUNTING HEIGHTS ARE LISTED U.N.O.
  - BFC=BELOW FINISHED CEILING, ACT=ABOVE CABINET TOP
  - THE ABOVE LISTED EQUIPMENT IS SHOWN FOR CLARITY OF MOUNTING HEIGHT ONLY. ALL DEVICES MAY NOT BE USED ON THIS PROJECT OR SHOWN ON THESE DRAWINGS.

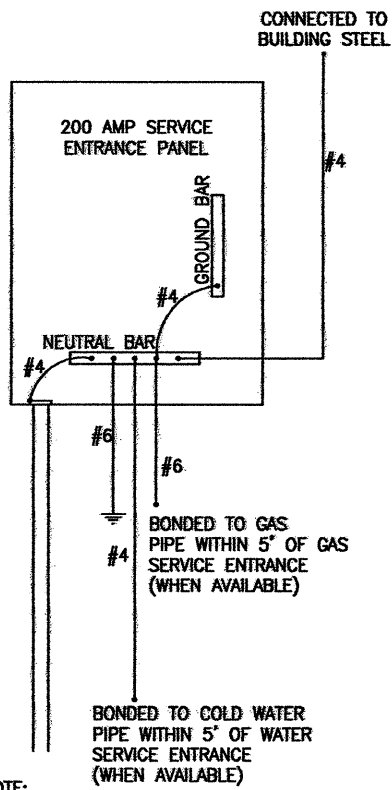
BUILDING ELECTRICAL LOAD SUMMARY			
LOAD	CONN. (KVA)	DEMAND (KVA)	DEMAND CALCULATION
LIGHTING	4.7	5.9	(CONNECTED x 1.25)
RECEPTACLES	3.6	3.6	{[(KVA -10) x 0.5]+10 KVA}
HVAC (HEATING)	30.0	31.25	{[LGST LOAD x 1.25] + OTHER LOAD}
HVAC (COOLING)	-	-	N/A
WATER HEATER	-	-	(CONNECTED x 1.25)
MISC. EQUIP.	9.0	6.0	(ELECTRIC DOOR OPENERS x 0.5)
TOTAL	44.0	46.75	
TOTAL AMPS @ 240V/1Ø		194	

### ELECTRICAL LEGEND (REFER TO MOUNTING HEIGHT SCHEDULE FOR MOUNTING HEIGHT INFORMATION)

○ H.L.D. LIGHT FIXTURE, AS SPECIFIED.	\$ WALL SWITCH, SINGLE POLE, 20 AMP, 120 V., "SPEC. GRADE"
□ H.L.D. WALL PACK	\$M MANUAL MOTOR STARTER, 30A, 240V
□ JUNCTION BOX	\$T TWIST TIMER SWITCH
◀ TELEPHONE OUTLET WITH COVER SEE DETAIL FOR INSTALLATION INSTRUCTIONS.	□ NON-FUSED DISCONNECT SWITCH, 240V, 30A, U.N.O.
◀ DATA/LAN OUTLET WITH COVER. SEE DETAIL FOR INSTALLATION INSTRUCTIONS.	□ FUSED DISCONNECT SWITCH DISCONNECT FUSE SIZE DISCONNECT FRAME SIZE
EXIT LIGHT	GROUND - EXTEND AND CONNECT TO APPROVED GROUND
EMERGENCY EXIT LIGHT	□ ELECTRICAL PANEL - SURFACE MOUNTED.
EMERGENCY LIGHT WALL MOUNTED UNLESS NOTED OTHERWISE.	□ UNSWITCHED CIRCUIT, 2Ø/12 & 1 Ø/12 G. IN 3/4" C., U.N.O.
◉ DUPLEX RECEPTACLE, 20 AMP, 120 V., "SPEC. GRADE"	□ SWITCHED CIRCUIT
◉ 220 V. RECEPTACLE, MATCH APPLIANCE PLUG	1-# PANEL NAME-CIRCUIT #
◉ CEILING MOUNTED TWIST LOCK RECEPTACLE	WP WEATHER PROOF
◉ QUAD RECEPTACLE, 20 AMP, 120 V., "SPEC. GRADE"	A.F.F. ABOVE FINISHED FLOOR
◉ OVERHEAD DOOR CONTROL	N.L. NIGHT LIGHT
	U.N.O. UNLESS NOTED OTHERWISE
	LC LIGHTING CONTACTOR

### LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMPS	VOLTS	WATTS	B.F.
A	VAPORLUME 8 FT. PROTECTED FIXTURE W/ ACRYLIC LENS, SUITABLE FOR WET LOCATIONS. PROVIDE WITH (4) 4 FT. 32W LAMPS, TANDEM MOUNTED, AND 120 VAC LOW-TEMP. BALLAST. DAYBRITE # TW2-W-P-332-120-1/3ED-LT. ALTERNATE EQUALS BY COLUMBIA OR LITHONIA ARE ACCEPTABLE.	6-32W FLUORESCENT	120	192	0.91
B	EXTERIOR WALL PACK WITH POLYCARBONATE LENS AND ALUMINUM FRAME. DARK BRONZE FINISH AND WET LOCATION LISTED. PROVIDE LITHONIA TWP-2/42-120-LPA OR EQUAL BY AEL OR EVERLAST.	2-42W COMPACT FLUORESCENT	120	84	-
	CEILING OR WALL MOUNTED LED EXIT & 2-HEAD EMERGENCY LIGHT CONFORMING TO NFPA 101 STANDARDS, w/ BATTERY & SOLID STATE CHARGER, SELF DIAGNOSTICS w/ A TEST CYCLE EVERY 30 DAYS MINIMUM, SELF-CONTAINED, DOUBLE OR SINGLE WHITE FACE/BODY, ABS THERMOPLASTIC HOUSING, PILOT & STATUS INDICATING LIGHTS, TEST SWITCH, & 120 MIN. EMERGENCY RUN TIME. EXIT LIGHT SHALL CONTINUE TO OPERATE FOR 24 HOURS FOLLOWING POWER OUTAGE. EXIT SIGN SHALL HAVE 5 YEAR WARRANTY. PROVIDE MOPHILBEN, EMERGLITE OR LITHONIA.	RED LED 2-5.4W TUNGSTEN	120/6V	10.8	N/A
	WEATHERPROOF EXTERIOR REMOTE HEADS. PROVIDE MOPHILBEN, EMERGLITE OR LITHONIA. FIXTURE SHALL COMPLY WITH NEC AND NFPA 101 STANDARDS FOR TWO LAMP EMERGENCY LIGHTING.	2-6W TUNGSTEN	120/6V	12	N/A



- NOTE:
- THIS DRAWING ONLY SHOWS GROUNDING ELECTRODE CONDUCTORS AND BONDING JAMPERS. ALL CONDUITS SHALL ALSO HAVE EQUIPMENT GROUNDING CONDUCTORS SIZED PER NEC AND DRAWINGS.
  - BONDING OF GAS PIPE IS TO EQUALIZE POTENTIAL OF GAS PIPE ONLY, AS REQ'D BY N.E.C. & VOLUME VI OF NCBG.

### SERVICE ENTRANCE GROUNDING DETAIL

SCALE: NTS

### ELECTRICAL SYSTEM AND EQUIPMENT

#### METHOD OF COMPLIANCE:

PREScriptive ☐ PERFORMANCE ☒ ENERGY COST BUDGET ☐

Provide a standard riser diagram which indicates designated points for check metering.  
Provide a standard panel schedule description which identifies different induced loads.

#### LIGHTING SCHEDULE

LAMP TYPE REQUIRED IN FIXTURE: VARIES (SEE LIGHT FIXTURE SCHEDULE THIS DRAWING)  
NUMBER OF LAMPS IN FIXTURE: VARIES (SEE LIGHT FIXTURE SCHEDULE THIS DRAWING)  
BALLAST TYPE IN FIXTURE: VARIES (SEE LIGHT FIXTURE SCHEDULE THIS DRAWING)  
NUMBER OF BALLASTS IN FIXTURE: VARIES (SEE LIGHT FIXTURE SCHEDULE THIS DRAWING)  
TOTAL WATTAGE PER FIXTURE: VARIES (SEE LIGHT FIXTURE SCHEDULE THIS DRAWING)  
TOTAL INTERIOR WATTAGE SPECIFIED VS. ALLOWED: **3,284W VS. 3,422W**  
EXTERIOR LIGHTING COMPLIES WITH NORTH CAROLINA ENERGY CODE, SECTION 805.5

EQUIPMENT SCHEDULES WITH MOTORS (Not used for mechanical systems)

MOTOR HORSEPOWER:  
NUMBER OF PHASES:  
MINIMUM EFFICIENCY:  
MOTOR TYPE:  
# OF POLES:

#### DESIGNER STATEMENT:

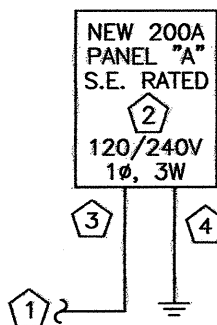
To the best of my knowledge and belief, the design of this building complies with the electrical system and equipment requirements of the North Carolina Building Code, Volume X - Energy

SIGNED: D. Wilson

NAME: D. WILSON, P.E.

TITLE: PRESIDENT

#### BUILDING INTERIOR



#### ELECTRICAL RISER NOTES:

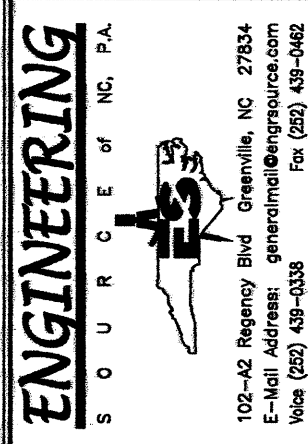
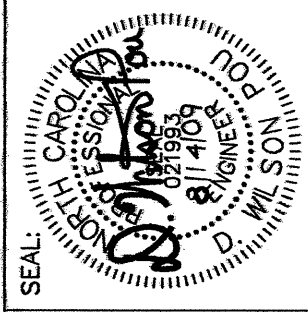
- E.C. SHALL COORDINATE WITH LOCAL UTILITY COMPANY IN REGARDS TO RENOVATED ELECTRICAL. VERIFY THAT EXISTING TRANSFORMER IS SIZED LARGE ENOUGH FOR NEW ADDITIONAL LOAD. PROVIDE ALL LABOR, MATERIALS, ETC. AS REQUIRED BY LOCAL UTILITY COMPANY.
- E.C. SHALL REMOVE EXISTING 100A, 240V, 1Ø LOADCENTER AND REPLACE WITH NEW 200A, 120/240V, 1Ø, MAIN BREAKER PANELBOARD.
- PROVIDE 3-#3/0 IN EXISTING 2" C BELOW SLAB
- E.C. SHALL MODIFY FIELD SURVEY EXISTING GROUNDING SYSTEM OF BUILDING. MODIFY GROUNDING SYSTEM AS NECESSARY TO ACCOMMODATE NEW RENOVATION. GROUNDING SYSTEM MUST BE IN COMPLIANCE WITH NEC, ARTICLE 250.

### ELECTRICAL RISER

SCALE: N.T.S.

PANELBOARD A			VOLTAGE: 120/240 3 WIRE			NEUTRAL: <input type="checkbox"/> NONE <input checked="" type="checkbox"/> 50% <input checked="" type="checkbox"/> 100%										
MOUNTING: <input type="checkbox"/> FLUSH <input checked="" type="checkbox"/> SURFACE		FEED: <input type="checkbox"/> TOP <input checked="" type="checkbox"/> BOTTOM		MAIN: <input type="checkbox"/> LUGS ONLY <input checked="" type="checkbox"/> MAIN BREAKER		FRAME: 200A TRIP: 200_A		BUS: <input type="checkbox"/> ALUMINUM <input checked="" type="checkbox"/> COPPER								
COVER: <input checked="" type="checkbox"/> DOOR WITH LOCK <input type="checkbox"/> DOOR WITHOUT LOCK			ALL BRANCH BREAKERS 20A 1 POLE UNLESS NOTED OTHERWISE U/L LISTED BREAKER INTERRUPTING CAPACITY: 22000 A RMS. SYM. MIN.													
DESCRIPTION	LOAD	CKT NO.		CKT NO.	DESCRIPTION	LOAD	PHASE LOAD (VA)									
							L1	L2								
H-1 FAN & IGNIGHTOR	500	1		2	SPARE	2500	5000	/								
H-2 THRU 4 FAN & IGNIGHTOR	1500	3		4	(2-#10 & 1-#10G IN 3/4")	2500		5000								
SPARE	2500	5		6	SPARE	2500	5000	/								
(2-#10 & 1-#10G IN 3/4")	2500	7		8	(2-#10 & 1-#10G IN 3/4")	2500		5000								
SPARE	2500	9		10	SPARE	2500	5000	/								
(2-#10 & 1-#10G IN 3/4")	2500	11		12	(2-#10 & 1-#10G IN 3/4")	2500		5000								
LIGHTING CONTACTOR LC-1	250	13		14	AREA 1 RECP	540	790	/								
AREA 2 LTS	1152	15		16	AREA 2 LTS	1344		2496								
AREA 2 RECP	720	17		18	AREA 2 RECP	900	1620	/								
AREA 1 LTS	768	19		20	TELEPHONE BOARD	360		1128								
EXTERIOR LTS	1475	21		22	AREA 1 EF-C	500	1975	/								
OVERHEAD DOOR OPENER	1176	23		24	AREA 2 EF-A	80		1256								
OVERHEAD DOOR OPENER	1176	25		26	AREA 2 EF-B	1176	2352	/								
OVERHEAD DOOR OPENER	1176	27		28	TANK PUMP	300		1476								
OVERHEAD DOOR OPENER	1176	29		30	OVERHEAD CORD SPOOLS	900	2076	/								
OVERHEAD DOOR OPENER	1176	31		32	CONTAINMENT SUMP PUMP	696		1872								
SPARE		33		34	SPARE			/								
SPARE		35		36	SPARE			/								
SPARE		37		38	SPARE			/								
SPARE		39		40	SPARE			/								
SPARE		41		42	SPARE			/								
PANELBOARD LOCATION: EXISTING BAY INTERIOR WALMANUFACTURER: SEE NOTE BELOW																
MODEL/CAT. NO.: NQOD																
FEED: SEE RISER																
<table><tr><td>KEY:</td><td> GFI BREAKER</td><td> LOCKON ATTACH</td><td> MULTIPOLE BREAKER</td></tr><tr><td></td><td> PADLOCK ATTACH</td><td> ARC FAULT CIRCUIT</td><td></td></tr></table>									KEY:	GFI BREAKER	LOCKON ATTACH	MULTIPOLE BREAKER		PADLOCK ATTACH	ARC FAULT CIRCUIT	
KEY:	GFI BREAKER	LOCKON ATTACH	MULTIPOLE BREAKER													
	PADLOCK ATTACH	ARC FAULT CIRCUIT														
							TOTAL L1	21813								
							TOTAL L2	22228								
							TOTAL VA	44041								

\*\* PROVIDE PANELBOARD, LOADCENTERS ARE NOT ACCEPTABLE. PROVIDE SQ.D, G.E., SIEMANS OR CUTLER-HAMMER. \*\*



FACILITIES DESIGN  
ARCHITECTS & ENGINEERS  
GENERAL SERVICES DIVISION, NCDOT  
1 SOUTH WILMINGTON STREET  
919/715-0400 FAX: 919/715-0399  
RALEIGH, NORTH CAROLINA 27601



PROJECT: BURGAW ROADSIDE STORAGE  
SHELTER RENOVATION  
HIGHWAY DIVISION 3, NCDOT  
PENDER COUNTY, NORTH CAROLINA

SCO PROJECT NO.  
07-07006-02A

ES JOB NO.  
ES08033

#### REVISIONS

06-10-09 SCO-1

08-14-09 SCO-2

03-16-10

DATE ISSUED: 05-02-08

DRAWN BY: DWP

CHECKED BY:

SHEET NO.

2.1

OF